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PATENT ABSTRACTS OF JAPAN

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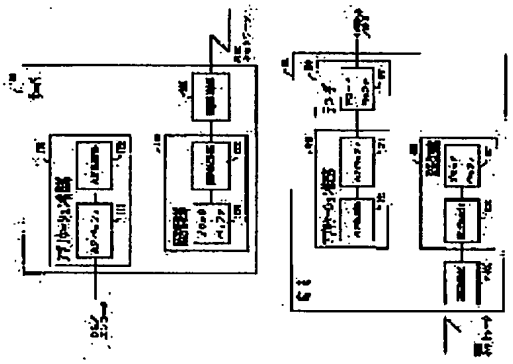
(54) CONTINUOUS DATA DISTRIBUTION METHOD AND SYSTEM

(57)Abstract:
PROBLEM TO BE SOLVED: To deliver continuous data to a large number of terminal equipments with high quality without error by sending the same block to terminal equipments for a plurality of number of times and compensating missing data with data of succeeding blacks when missing data are caused in a 1st block delivery.
SOLUTION: An application processing section 112 of a server 100 gives data to a delivery processing section 122 in the unit of blocks. The delivery processing section 122 has a block buffer 121 for the transmission of blocks for plural number of times. Upon the receipt of a data packet by a communication control section 330, a terminal equipment 300 references a packet management table and when the packet reception is not recorded (that is, the packet is received at first), the packet is stored in a block buffer 321. If the packet has already been received, the packet is not stored but aborted. In this case, the same block is sent to the terminal equipment for plural number of times and missing data take place in the first block delivery, the missing data are compensated by the succeeding block data. Thus, efficient duplicate data delivery is realized.



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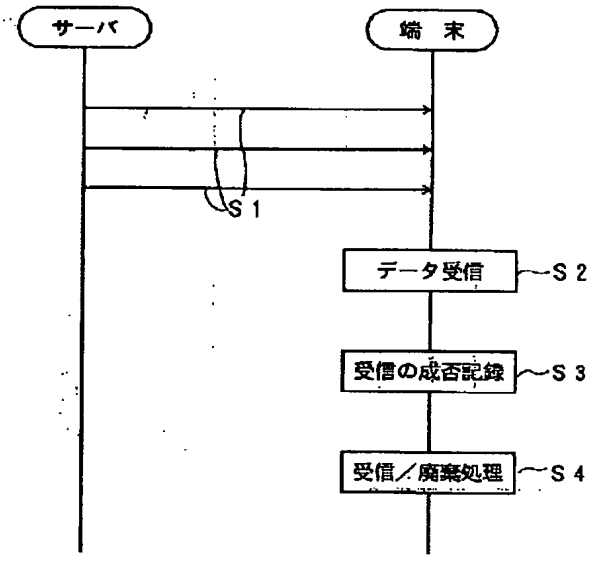
(54)【発明の名称】　連続データ配送方法及びシステム

(57)【要約】

【課題】　ＡＶ情報のような連続データについて、ネットワークのデータ伝送誤りの劣化や端末での一時的な受信性能劣化のため、データ損失が起こる場合でも、連続データを誤りなく、高品質で多数の端末に対して配送することが可能な連続データ配送方法及びシステムを提供することを目的とする。

【解決手段】　本発明は、サーバにおいて、連続データの符号化レートと通信ネットワークの送信速度の差により生じる通信空き時間を利用して、同一ブロックを複数回端末に送信し、初回のブロック配送で欠落が生じた場合には、後続のブロックのデータで補う。

本発明の原理を説明するための図



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【特許請求の範囲】

【請求項１】　通信ネットワークを介して、サーバから少なくとも１つの端末に対して連続して情報を配送する連続データ配送方法において、

前記サーバにおいて、

前記情報の符号化レートと前記通信ネットワークの送信速度の差により生じる通信空き時間を利用して、同一ブロックを複数回端末に送信し、

初回のブロック配送で欠落が生じた場合には、後続のブロックのデータで補うことを特徴とする連続データ配送方法。

【請求項２】　前記サーバにおいて、

連続するデータをシーケンス番号を付与したブロック単位及びブロックを細分したパケット単位で前記端末に配送し、

前記端末において、

前記サーバから配送された前記ブロック単位及び前記パケット単位のデータを受信し、

前記パケット単位のデータのパケットのシーケンス番号に基づいて、データパケッド単位の受信の成否の記録を行い、

前記受信の成否の記録とたった今受信したパケットのシーケンス番号を照合して、該受信データパケットが以前に未受信であれば、ブロックバッファに格納処理し、

該受信データパケットが受信済みであれば、格納せずに廃棄することを特徴とする連続データ配送方法。

【請求項３】　前記サーバ内に複数のブロックバッファを用意し、外部からの前記情報を先行して読み込み、該複数のブロックバッファに格納しておき、

前記端末へのブロック配送の空きが生じないように制御する請求項１または２記載の連続データ配送方法。

【請求項４】　前記端末において、

前記サーバより配送開始通知を受信した際に、

データ配送の一番最初に受信した配送開始通知に対してのみ、前記サーバに応答を返却する請求項２記載の連続データ配送方法。

【請求項５】　通信ネットワークと、該通信ネットワークを介して接続されるサーバと、該サーバから該通信ネットワークを介して連続してデータを配送される少なくとも一つの端末から構成される連続データ配送システムであって、

ブロック単位に分割された連続データの配送／受信を管理するアプリケーション管理手段と、

前記ブロックをパケットに分割し、パケット単位で配送処理する配送処理手段とを含むサーバ及び端末から構成されることを特徴とする連続データ配送システム。

【請求項６】　前記サーバの配送処理手段は、

連続するデータをシーケンスを付与したブロック単位、及びブロックを細分化したパケット単位で端末に重複させて配送する重複配送手段を含む請求項５記載の連続データ配送システム。

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【請求項７】　前記端末は、

前記シーケンス番号に基づいてデータパケット単位の受信の成否を記録する成否記録手段と、

前記成否記録手段を参照して、受信したデータパケットが以前に未受信であれば、格納処理し、受信済のデータパケットであれば破棄するパケット格納・破棄手段を含む請求項５記載の連続データ配送システム。

【請求項８】　前記サーバの配送処理手段は、

データ配送の一番最初及びブロックの配送の毎に、次のブロック配送に先だって、配送開始通知パケットを前記端末に配送する配送開始通知手段と、

配送の完了時に配送完了通知パケットを前記端末に配送する配送完了通知手段を含む請求項５記載の連続データ配送システム。

【請求項９】　前記端末の配送処理手段は、

前記サーバから前記配送開始通知を受信すると当該配送開始通知が、データ配送の一番最初の通知であるときのみ、前記サーバに応答を返却する応答手段を含む請求項５及び７記載の連続データ配送システム。

【請求項１０】　前記サーバの前記配送処理手段は、

複数のブロックバッファを有し、前記アプリケーション管理手段のアプリケーションバッファからの読み込みを先行し、該ブロックバッファに格納する第１の先行格納手段を含む請求項５記載の連続データ配送システム。

【請求項１１】　前記端末の前記アプリケーション管理手段は、

複数のアプリケーションバッファを有し、前記配送管理手段のブロックバッファからの読み込みを先行し、該アプリケーションバッファに格納する第２の先行格納手段を含む請求項５記載の連続データ配送システム。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、連続データ配送方法及びシステムに係り、特に、撮影中のＡＶ（Audio-Visual）情報や、連続して、あるいは、適当な頻度で入力され、特定の書式に従って、コード化された文字・数値情報（以下連続コード情報と呼ぶ）や、大容量データベースに格納されたＡＶ情報や連続コード情報を端末に配送し、即座に再生する連続データの提供を行う連続データ配送方法及びシステムに関する。

【０００２】また、本発明は、端末において、サーバから受信した受信情報を大容量のデータベースに格納して再利用するようなシステムにも適用される。

【０００３】

【従来の技術】従来の連続データの配送技術としては、データの配送時に、単に、サーバから複数の端末に対して配送データを送信する方法がある。例えば、インターネットのＭＢＯＮＥ実験で行われているものが知られているが、これは、マルチキャスト配送（端末グループへ

の配送）を利用している。この配送方法は、データは、単に配送のみを行っているため、欠落データへの処理は行われない。

【０００４】図１６は、従来の複数端末へのデータ配送シーケンスを示す。同図において、通信に用いられるバッファがブロックバッファである。情報の符号化／復号化の処理は、エンコーダ／デコーダにおいて、処理が行われる。さらに、符号化／復号化と通信の処理の間にＡＰバッファが中間バッファとして設けられる。従来は、アプリケーションバッファを用いないものもある。

【０００５】図１６において、撮影機やマイクを利用したＡＶデータのリアルタイムの撮影が行われると、それらのＡＶデータは、エンコードバッファに蓄積され、ＡＶセグメント化されて、アプリケーションバッファに蓄積される。これをサーバから端末に配送する場合には、配送ブロックに分割してブロックバッファに蓄積しておき、配送時に、ブロック毎に複数の端末に配送される。

【０００６】端末側では、サーバから受信したブロックをブロックバッファに蓄積し、配送ブロック毎にアプリケーションバッファに蓄積され、デコードを行うことにより出力機器に再生される。連続コード情報の場合、数値をグラフ表示する等の処理を施して出力機器に表示される場合もある。

【０００７】また、従来の方式として、ブロック化せずに、単に与えられたデータをそのまま逐次配送する方法もある。ブロック化による配送または、データをそのまま転送するいずれの方法においても従来は、通信空き時間が生じた場合でも利用せずに、データは１回だけ配送される。

【０００８】なお、パケットは１Kbyte程度、ブロックは、数Mbyte、ＡＶセグメントは数百byte程度の大きさである。

【０００９】

【発明が解決しようとする課題】しかしながら、上記に示すように、従来は、ネットワーク上でのデータの伝送誤りや紛失あるいは、受信端末において、バッファが溢れた等の理由により、配送データに損失が生じた場合、端末では、欠落したまま再生されるので、配送情報の品質が劣化する。端末で受信データをデータベースに格納する場合も受信した時点では、劣化したままである。

【００１０】従って、上記の従来の方式では、配送データの一部欠落に対して対処できないため、ネットワークの品質劣化や端末でのデータ紛失に対して受信情報の品質が劣化し、高品質の情報再生ができなくなるという問題がある。本発明は、上記の点に鑑みなされたもので、情報や連続コード情報のような連続データについて、ネットワークのデータ伝送誤りの劣化や端末での一時的な受信性能劣化のため、データ損失が起こる場合でも、連続データを誤りなく、高品質で多数の端末に対して配送することが可能な連続データ配送方法及びシステムを提供することを目的とする。

【００１１】

【課題を解決するための手段】本発明は、通信ネットワークを介して、サーバから少なくとも１つの端末に対して連続して情報を配送する連続データ配送方法において、サーバにおいて、情報の符号化レートと通信ネットワークの送信速度の差により生じる通信空き時間を利用して、同一ブロックを複数回端末に送信し、初回のブロック配送で欠落が生じた場合には、後続のブロックのデータで補う。

【００１２】図１は、本発明の原理を説明するための図である。本発明は、サーバにおいて、連続するデータをシーケンス番号を付与したブロック単位及びブロックを細分したパケット単位で端末に配送し（ステップ１）、端末において、サーバから配送された前記ブロック単位及び前記パケット単位のデータを受信し（ステップ２）、パケット単位のデータのパケットのシーケンス番号に基づいて、データパケット単位の受信の成否の記録を行い（ステップ３）、受信の成否の記録とたった今受信したパケットのシーケンス番号を照合して、該受信データパケットが以前に未受信であれば、ブロックバッファに格納処理し（ステップ４）、該受信データパケットが受信済みであれば、格納せずに廃棄する（ステップ４）。

【００１３】また、本発明は、サーバ内に複数のブロックバッファを用意し、外部からの情報を先行して読み込み、該複数のブロックバッファに格納しておき、端末へのブロック配送の空きが生じないように制御する。また、本発明は、端末において、サーバより配送開始通知を受信した際に、データ配送の一番最初に受信した配送開始通知に対してのみ、サーバに応答を返却する。

【００１４】図２は、本発明の原理構成図である。本発明は、通信ネットワークと、該通信ネットワークを介して接続されるサーバと、該サーバから該通信ネットワークを介して連続してデータを配送される少なくとも一つの端末から構成される連続データ配送システムであって、ブロック単位に分割された連続データの配送／受信を管理するアプリケーション管理手段１１０、３１０と、ブロックをパケットに分割し、パケット単位で配送処理する配送処理手段１２０、３２０とを含むサーバ１００及び端末３００から構成される。

【００１５】また、上記のサーバ１００の配送処理手段１２０は、連続するデータをシーケンスを付与したブロック単位、及びブロックを細分化したパケット単位で端末に重複させて配送する重複配送手段１４０を含む。また、上記の端末３００は、シーケンス番号に基づいてデータパケット単位の受信の成否を記録する成否記録手段３５０と、成否記録手段３５０を参照して、受信したデータパケットが以前に未受信であれば格納処理し、受信済のデータパケットであれば破棄するパケット格納・破

棄手段３８０を含む。

【００１６】また、上記のサーバ１００の配送処理手段１２０は、データ配送の一番最初及びブロックの配送の毎に、次のブロック配送に先だって、配送開始通知パケットを端末に配送する配送開始通知手段１６０と、配送の完了時に配送完了通知パケットを端末に配送する配送完了通知手段１５０を含む。

【００１７】また、上記の端末３００の配送処理手段３２０は、サーバから配送開始通知を受信すると当該配送開始通知が、データ配送の一番最初の通知であるときのみ、サーバ１００に応答を返却する応答手段３６０を含む。また、サーバ１００の配送処理手段１２０は、複数のブロックバッファを有し、アプリケーション管理手段のアプリケーションバッファからの読み込みを先行し、該ブロックバッファに格納する第１の先行格納手段を含む。

【００１８】また、端末３００のアプリケーション管理手段３１０は、複数のアプリケーションバッファを有し、配送管理手段３２０のブロックバッファからの読み込みを先行し、該アプリケーションバッファに格納する第２の先行格納手段を含む。

【００１９】上記のように本発明は、通信ネットワークを介して、サーバから複数の端末に対して連続して情報を配送する際に、情報の符号化レートと通信ネットワークの送信速度の差により生じる通信空き時間を利用して、同一ブロックを複数回端末に送信し、初回のブロック配送で欠落が生じた場合であっても、複数回同一のブロックを送信するため、当該ブロックのデータで補うことができる。

【００２０】また、本発明は、端末側で、サーバより受信したパケット単位のデータのパケットのシーケンス番号に基づいてデータパケット単位の受信の成否の記録を行うことにより、受信の成否の記録を参照して、受信したデータパケットが未受信であれば、ブロックバッファに格納して受信処理し、当該データパケットが受信済みであれば、格納せずに廃棄する処理を行うことにより、確実にブロックの欠落や紛失等を補完することが可能である。特に、パケットシーケンス番号の照会のみでデータ格納の判断を行うので、重複受信を行っても余分な格納領域やメモリ間のデータコピーが不要である。

【００２１】また、本発明は、サーバ内に複数のブロックバッファを用意し、外部からの情報を先行して読み込み、該複数のブロックバッファに格納しておくことにより、端末へのブロック配送の空きが生じない。また、本発明は、端末において、サーバより配送開始通知を受信した際に、データ配送の最初の配送開始通知に対してのみ、サーバに応答を返却し、第２ブロック以降の配送開始通知内の応答は省略し、当該配送開始通知についても重複して端末に送信することにより、上記と同様に救済されると共に、データ全体の通信時間を短縮することが可能となる。

【００２２】また、本発明は、端末において、サーバより配送完了通知を受信した際に、受信の成否の記録を、サーバに送信することにより、端末側で受信したデータに対する課金情報として利用することが可能となる。

【００２３】

【発明の実施の形態】図３は、本発明が適用されるシステム構成を示す。同図に示される情報の通信システムは、サーバ１００には撮影機・マイク１０６から取得した情報を符号化するエンコーダ１０７と、符号化されたＡＶ情報或いは連続コード情報を蓄積するデータベース１０８が接続される。連続コード情報は、逐次外部からデータベースに格納されていく場合もある。

【００２４】また、各端末３００$_1$、３００$_2$、…、３００$_n$には、デコードされた情報を再生出力する出力機器３０１及びデータベース３０２が接続されている。また、サーバ１００と複数の端末３００$_1$、３００$_2$、…、３００$_n$は、有線または、無線の通信ネットワーク２００に接続され、当該通信ネットワーク２００を介してサーバ１００から各端末３００$_1$、３００$_2$、…、３００$_n$にデータ配送される。

【００２５】撮影機・マイク１０６で入力された情報は、エンコーダ１０７で符号化され、サーバ１００に取り込まれる。情報は、予め大容量のデータベース１０８に格納されており、そこからサーバ１００に取り込まれる場合もある。端末３００側では、サーバ１００から配送された情報は直ちに、モニタやスピーカ等の出力機器３０１に出力される。端末３００では、受信情報をデータベース３０２に格納する場合もある。以上は、通常の連続データ配送サービスの利用例である。

【００２６】図４は、本発明のサーバの構成を示す。同図に示すサーバ１００は、アプリケーション管理部１１０、配送管理部１２０及び通信制御部１３０より構成される。アプリケーション管理部１１０は、アプリケーションバッファ１１１と、当該アプリケーションバッファ１１１の連続データをブロックに分割管理するアプリケーション処理部１１２を有する。配送管理部１２０は、ブロックバッファ１２１と、当該ブロックバッファ１２１のブロック単位及び細分したパケット単位のデータ転送を行い、１回のブロック配送が終わる毎に、アプリケーション処理部１１２に次のブロックを要求する配送処理部１２２を有する。

【００２７】図５は、本発明のサーバの配送処理部の構成を示す。配送処理部１２２は、パケット管理テーブル１２２３を含むパケット配送処理部１２２１と配送開始／終了処理部１２２２より構成される。パケット配送処理部１２２１は、ブロックをパケット単位で分割配送し、パケット管理テーブル１２２３において当該配送の成否を管理する。配送開始／終了処理部１２２２は、パケット配送の開始及び終了について管理する。

【００２８】図６は、本発明のサーバのパケット管理テーブルの例を示す。同図に示すパケット管理テーブル１２２３は、各パケット番号毎に、ブロックバッファ１２１の各パケット位置を管理する。同図に示すようにパケット管理テーブル１２２３は、各パケット毎にシーケンス番号（パケット番号）を割当て、各パケット毎にメモリ上の格納位置も指定している。プログラム実装上は、番号対応に固定サイズのパケット格納域を設けるが、メモリ上の格納位置まで陽に表現されない場合が多い。

【００２９】図７は、本発明の端末の構成を示す。同図に示す端末３００は、アプリケーション管理部３１０、配送管理部３２０、通信制御部３３０及びデコーダ３４１を有する。アプリケーション管理部３１０は、アプリケーション処理部３１２、アプリケーションバッファ３１１を有し、配送管理部３２０から渡された情報を取得し、アプリケーションバッファ３１１に格納する。

【００３０】配送管理部３２０は、配送処理部３２２とブロックバッファ３２１を有し、配送処理部３２２は、通信制御部３３０を介してサーバ１００からブロック単位及び細分されたパケット単位でデータの受信処理を行い、ブロック受信完了毎に受信ブロックをアプリケーション管理部３１０のアプリケーション処理部３１１に渡す。

【００３１】デコーダ３４０は、アプリケーション管理部３１０から渡された符号化された情報をデコードしてデコードバッファ３４１に蓄積すると共に、外部ＡＶ出力または、データベース３０２に出力する。図８は、本発明の端末の配送処理部の構成を示す。配送処理部３２２は、パケット管理テーブル３２２３を含むパケット配送処理部３２２１と配送開始／終了処理部３２２２を有する。

【００３２】パケット管理テーブル３２２３は、図９に示すように、受信したパケット番号毎に、ブロックバッファ３２１の各パケット位置を示し、更に、当該パケット毎に受信済か未受信かを管理する。このように端末３００のパケット管理テーブル３２２３は、各パケット毎に、パケット受信済／未受信を記録するフィールドも、各パケット毎に持っている。成否は同図では、○×で示しているが、実装上では、ビットＯＮ（＝１）、或いはビットＯＦＦ（＝０）の１ビットで表現される。パケットシーケンス番号は整数であり、１０Mbyteブロックを１Kbyte長のパケットに分割した場合、１番から１００００番までとなる。格納位置の形式は各コンピュータシステムあるいは、テーブルを記述するプログラミング言語において用いられる通常の形式に従う。

【００３３】次に、上記の構成の一連の概要動作を説明する。図１０は、本発明の連続配送の一連の動作を説明するための図である。アプリケーション処理部１１２は、外部から配送要求を受けると、アプリケーションバッファ１１１のデータをブロックに分割し、配送開始の通知を端末３００に通知する。

【００３４】端末３００の配送処理部３２２の配送開始／終了処理部３２２２において、配送開始通知を受けると、端末３００の配送管理部３２２は、ブロックバッファ３２１を用意し、アプリケーション処理部３１２は、アプリケーションバッファ３１１とブロック管理テーブル３２２３を用意し、受信の準備を行う。

【００３５】サーバ１００のアプリケーション処理部１１２は、ブロック単位で配送処理部１２２にデータを渡す。配送処理部１２２では、ブロックバッファ１２１を用意し、複数回ブロック送信を行う。同図では、この重複回数を３回の例を示している。

【００３６】端末３００は、通信制御部３３０でデータパケットを受信すると、パケット管理テーブル３２２３を参照して、未受信であれば（当該パケットを初めて受信した時は）、そのパケットをブロックバッファ３２１に格納する。もし、既に受信済であれば、当該パケットは格納せずに、廃棄する。

【００３７】この端末３００の動作により、損失パケットの受信成功率を向上させることができる。また、既受信パケットは直ちに廃棄するので、余分な格納領域やメモリ間のデータコピーが不要である。ネットワークとの接続処理、パケットの転送処理、並びにパケットのビットエラー誤りの検出及び誤りパケットの廃棄は、サーバ１００及び端末３００の通信制御部１３０、３３０において行われる。

【００３８】このように、本発明では、同一ブロックを複数回（同図では３回）各端末３００に配送する。端末３００では、ブロックを重複受信する。後述するが、同じブロックの２回目以降の配送では、未受信パケットのみブロックバファ３２１に格納し、既受信パケットは直ちに破棄する。

【００３９】なお、同図では、重複配送が３回の場合を示しているが、情報の符号化及び復号化レートとネットワーク２００で利用できるデータ送信速度の差によって、２回の場合もあるし、さらに、４回以上の場合もある。このように、本発明は、サーバ１００において、ブロック配送後の次の新規のブロック配送の空き時間を重複配送に利用し、端末３００において、パケットシーケンス番号に基づいて重複受信処理を行うことにより、効率的な重複データ配送が実現でき、受信データの品質の向上が図れる。

【００４０】また、複数端末へのマルチキャスト送信（グループを指定したデータの一斉送信）は、マルチキャスト通信可能なＯＳ（オペレーティングシステム）を利用することにより実現できる。即ち、サーバ１００及び端末３００の通信制御部１３０、３３０として、例えば、ＵＤＰ（User Datagram Protocol）及びＩＰ(Internet Protocol）のプロトコル処理が可能なＯＳを用いることにより実現できる。特に、ＩＰのグループアドレス

（クラスDアドレス）の処理が可能なＯＳを利用する。ＵＤＰの処理では、受信パケットのビット誤りの検出とビット誤りパケットの廃棄も含まれる。

【００４１】また、情報の符号化技術として高能率で低ビットレートの符号化方法ＭＰＥＧ標準化、及びＭＰＥＧの方法に基づくエンコーダ及びデコーダの製品化（ＬＳＩ，通信ボード）が進み、一方で、ネットワークもフレームリレーやＡＴＭのような高速ネットワーク技術が利用可能になりつつある。本発明は、このような低ビットレート情報符号化技術と、高速ネットワークを利用することにより生じるデータ配送の空き時間を重複配送に利用するものである。また、文字・数値情報等の低ビットレートで、符号化できる連続コード情報についても高速ネットワークを利用することによりより、同様に重複配送ができる。ここで、情報の復号化も符号化に用いるエンコーダと同じ復号レートのデコーダを通常用いる。

【００４２】符号化及び復号化レートの例を以下に示す。

ＭＰＥＧ１：１．５Mb/s 程度；
ＭＰＥＧ２：６Mb/s 程度；
ＭＰＥＧ４：６４Kb/s 程度；
文字コード：６．４Kb/s 程度（４００文字／ｓ，２バイトコードの場合）：ネットワークの通信速度の例を以下に示す。
ＡＴＭ：１５６Mb/s，６２２Mb/s：イーサネットＬＡＮ：１０Mb/s，ＦＤＤＩ－ＬＡＮ：１５０Mb/s：高速専用線、フレームリレー：１．５Mb/s，６Mb/s等：

【００４３】

【実施例】以下、本発明の実施例を図面と共に説明する。まず、図４および図７に示すサーバ１００と端末３００について説明する。サーバ１００及び端末３００共に、アプリケーション管理部１３０、３３０にアプリケーションバッファ１１１、３１１を有し、サーバ１００では、アプリケーション処理部１１２がブロック単位で配送処理部１２２に配送データを渡す。配送管理部１２０にブロックバッファ１２１を有し、サーバ１００では、配送処理部１２２がブロックバッファのブロックをデータパケットに分割し、通信制御部１３０を介してデータ配送を行う。

【００４４】端末３００では、通信制御部３３０を介して受信したデータパケットを配送処理部３２２が受信するか廃棄するかの判断を行い、ブロックバッファ３２１に格納していく。すべてパケットが揃う等の契機で、受信したデータブロックをアプリケーション処理部３２２を介してアプリケーションバッファ３１１に格納する。

【００４５】アプリケーションバッファ１１１、３１１は、ブロックバッファ１２１、３２１以上の大きさを有する。サーバ１００側では、エンコーダ１０７から渡されたＡＶセグメントを逐次蓄積していき、データ（ＡＶセグメント）が蓄積された順にアプリケーション処理部１１２を介してブロック単位で配送のために消費されていく。

【００４６】端末３００側では、サーバの配送処理部１２２から受け取ったブロックを配送処理部３２２、アプリケーション処理部３１２を介して、アプリケーションバッファ３１１に逐次蓄積し、蓄積された順にＡＶセグメント単位で外部出力あるいは、データベース３０２への蓄積のために消費されていく。

【００４７】本実施例では、エンコーダ１０７は、サーバ１００の外部におき、デコーダ３４０は、端末３００内部に設けた構成とする。勿論、エンコーダ１０７がサーバ１００との一体構成や、デコーダ３４０が端末３００の外部に設けられる構成も可能である。

【００４８】通常エンコーダ１０７の方が処理の負荷が大きいので、独立した構成をとることが多く、デコーダ３４０は、製品化が進みＬＳＩやボードとして端末内に組み込まれる場合が多いので、図７に示す構成としている。サーバ１００から端末３００に対して、配送を開始する際に、データ配送に先立って、サーバ１００の配送処理部１２２の配送開始／終了処理部１２２２から配送開始通知パケットが配送される。

【００４９】図１１は、本発明の一実施例の配送開始通知パケットの構成を示す。これは、データ配送の一番最初及びブロックの配送毎に次のブロック配送に先立って、サーバ１００から端末３００に通知される。複数端末に対しては、効率のためマルチキャストで行うものとする。２番目以上の配送開始通知パケットは、次のブロック配送開始を端末３００に知らせるために念のために行うものである。端末３００は、１ブロック分のパケット受信を完了したときや、１ブロック分受信のタイムアウトによっても１回分のブロック配送の完了及び次のブロック受信準備の契機を得ることができる。

【００５０】同図に示す配送開始通知パケット６００には、端末宛先６０１、パケットの種別（配送開始通知パケットであること）を示すパケットＩＤ６０２、及び配送情報６０３から構成される。配送情報６０３には、ブロックサイズ６０５及びブロック配送が何番目を示すブロック番号６０６を含む。

【００５１】ブロック番号６０６の符号長については、１６ビットで符号化すると、２の１６乗で６５５３６個まで表現でき、１０Mbyteブロックで約６５５．３６Gbyteまで扱うことができる。３２ビットで符号化すると、２の３２乗で4,294,967,29個まで表現でき、１０Mbyteブロックで約４２９４９．６Tbyteまで扱うことができる。短い１００Kbyteブロックを用いた場合でも、ブロック番号６０６を１６ビット、３２ビットで符号化するとそれぞれ約６．５５Gbyte、約４２９Tbyteまでのデータ容量を扱うことができ、実用上問題がない。

【００５２】サーバ１００から配送した配送開始通知パ

ケットに対して、確認のため、端末から応答を返してもらう。但し、配送開始通知パケットは、配送開始及びブロックの先頭配送時に配送するが、端末３００から応答を返却して貰うのは、配送開始時のみとし、途中の先頭以外のブロックの配送では、この応答待ちを行わない。その代わり、通知パケットを重複して転送するため、ネットワーク等での通知パケット紛失に有効である。ブロックサイズも固定値を用いるのであれば、初回の配送開始通知パケットで通知されたブロックサイズを固定的に用いる。

【００５３】図１２は、本発明の一実施例のデータパケットのデータ構成を示す。同図に示すデータパケットは、サーバ１００から端末３００にブロックを分割して送るパケットである。データパケットＤ００は、端末宛先Ｄ０１、パケット種別Ｄ０２、パケット番号Ｄ０Ｂ、パケット番号Ｄ０Ｐ、ユーザデータＤ－３より構成される。複数宛先配送の場合は、端末宛先Ｄ０１には、グループアドレスが用いられる。パケット種別Ｄ０２には、データパケットであることが示される。ブロック番号Ｄ０Ｂには、図１１に示した配送開始通知パケットのブロック番号（シーケンス番号）が設定される。パケット番号Ｄ０Ｐには、当該パケットのシーケンス番号が符号化される。ユーザデータ部Ｄ０３にはブロックを分割したデータが設定される。

【００５４】ここで、ブロック番号を用いているのは、端末３００で一連のデータパケットを受信中に、当該受信ブロック以前の既に受信処理が完了しているブロックのパケットが紛れこんできたとき、このパケットをブロック番号により判断して廃棄するためである。

【００５５】図１３は、本発明の一実施例の配送完了通知パケットの構成を示す。配送完了通知パケットＦ００は、端末宛先Ｆ０１と、配送完了通知であることを示すパケット種別を有する。複数端末への配送の場合には、端末宛先Ｆ０１にグループアドレスを用いる。

【００５６】以下に図１４及び図１５に基づいて本実施例のサーバ１００及び端末３００の動作を説明する。図１４は、本発明の一実施例のサーバの配送手順のフローチャートである。

ステップ８０１）　サーバ１００の外部からサーバ１００のアプリケーション処理部１１２に対してデータ配送の指示が行われる。このとき、端末３００のグループと送信すべき連続データが指定される。

【００５７】ステップ８０２）　サーバ１００は、配送開始の準備として、アプリケーション管理部１１０にアプリケーションバッファ１１１が用意される。サーバ１００の配送管理部１２０において、ブロックバッファ１２１及びブロックサイズとパケットサイズに応じて、パケット配送処理部１２２１内のパケット管理テーブル１２２３が用意される。このブロックバファ１２１は、予めサーバ１００及び各端末３００の利用可能メモリサイズを考慮した領域がメモリ上に確保されていることを前提としている。

【００５８】ステップ８０３）　アプリケーション処理部１１２が、配送処理部１２２に配送の開始を指示する。これにより、配送開始／終了処理部１２２２が配送開始通知パケット６００を生成し、端末３００にマルチキャストで送信する。

ステップ８０４）　配送開始／終了部１２２２は、配送開始通知パケットに対する各端末からの応答が揃うのを待機する。端末３００からの応答が全て揃ったとき、あるいは、タイムアウトにより制限時間が到来したとき、配送を行う端末３００のメンバを確定する。このメンバはステップ８０１で指定されたグループの範囲である。また、この時、サーバ１００は、外部のエンコーダ１０７に通知し、外部からの情報の入力及び符号化が始まる。符号化された連続データは、アプリケーションバッファ１１１へ逐次格納される。

【００５９】ステップ８０５）　配送管理部１２０のブロックバッファ１２１に、アプリケーションバッファ１１１から１ブロックを取り込む。

ステップ８０６）　配送管理部１２０がブロックバッファ１２１の１ブロックをパケット分割して配送する。複数端末に、マルチキャストを利用して通信制御部１３０を介して配送する。

【００６０】ステップ８０７）　更に、配送管理部１２０は、同じブロックを規定の回数だけ重複配送する。

ステップ８０８）　引き続いて次のブロック配送があるかないかを判定する。配送開始／終了処理部１２２２は、アプリケーション処理部１１２から終了が通知されるか、タイムアウトにより配送の終了を判定する。終了の場合には、ステップ８１０に移行し、継続の時はステップ８０９に移行する。

【００６１】ステップ８０９）　継続の場合には、配送開始／終了処理部１２２２は、ブロック番号をインクリメントし、配送開始通知パケット６００を送付し、各端末に次のブロックの配送が引き続いて行われることを通知し、ステップ８０５に移行し、次のブロックの配送に移行する。このとき、最初の通知を行うステップ８０３の処理と異なり、端末３００からの応答は待機せず、次の再送に直ぐ移行することにより、次のブロック再送までの時間を短縮する。この場合、配送開始通知パケットは複数個、各端末に送付することにより、ネットワーク上等での通知パケットの紛失に対して対処することができる。

【００６２】ステップ８１０）　次のブロックの配送開始指示終了の場合には、配送開始／終了処理部１２２２は、配送終了通知パケットＦ００を生成し、端末３００に配送する。複数端末の場合には、マルチキャストを用いて配送する。ここで、各端末３００からの応答の手順を設けることにより、各端末３００の受信の成否が記録

できる。この記録は、情報配送に対する課金を行う場合に管理上有効である。勿論、サーバ１００から端末３００への通知のみで、端末３００から応答を行わない手順を実装することもあり得る。応答を全て受けるか、タイムアウトとなった場合には、処理を終了する。

【００６３】以上の処理は、１つのブロックバッファ１２１が設けられている例を用いて説明したが、複数のブロックバッファを用意し、アプリケーションバッファ１１１から予備のブロックバッファ１２１への読み込みを先行して行うことも可能である。これによりステップ８０５の処理のために送信の空きが生じないように制御することが可能である。

【００６４】次に、サーバ１００の配送手順に対応する端末３００の手順を説明する。図１５は、本発明の一実施例の端末の配送処理手順のフローチャートである。

ステップ９０１）　端末３００は、配送処理部３２２の配送開始／終了処理部３２２２において、サーバ１００から配送された配送開始通知パケット６００を受信すると、アプリケーション処理部３１２に通知する。

【００６５】ステップ９０２）　アプリケーション処理部３１２では、配送開始通知を受けると、アプリケーションバッファ３１１を用意し、デコーダ３４０及び外部の出力装置３０１や、データベース３０２に準備を確認する。配送管理部３２０では、配送情報６０３のブロックダイズのブロックバッファ３２１とパケット管理テーブル３２２３を用意する。パケット管理テーブル３２２３は、ブロックサイズとパケットサイズにより決まる。本実施例では、ブロックサイズは配送開始通知パケット６００により通知され、パケットサイズはシステムで予め決められていることを想定している。

【００６６】ステップ９０３）　端末３００の配送処理部３２２は、配送開始通知に対する応答をサーバ１００に返却する。。

ステップ９０７）　配送開始通知を受信してから、パケット受信待ち状態となる。データパケットを受信すると、ステップ９１０のデータパケット１個の受信処理に移行する。１ブロックのパケットが全て揃うか、配送開始通知パケットを受信するかデータパケット待ちのままタイムアウトするとステップ９２０に移行する。

【００６７】ステップ９１０）　１個のデータパケットの格納／廃棄処理を以下のステップ９１１、９１２、９１３で説明する。当該ステップでは、各ブロックの配送において、重複した２個目以降の重複ブロックに対してのみ行い、１個目のブロックは全て受信処理することにより、パケット管理テーブル３２２３の照合の処理を重複しない初回のブロックに対して省くこともできる。この場合は、１個のデータパケットには、２個目以降との区別のための１ビットのフィールドをパケット構成に設けておけてばよい。

【００６８】ステップ９１１）　受信した１パケットのパケット番号をキーとしてパケット管理テーブル３２２３の当該パケットが未受信であるか（今回始めて受信したか）を判定する。未受信である場合には、ステップ９１２に移行し、既に受信している場合には、ステップ９１３に移行する。また、このとき、パケットのブロック番号もチェックし、古いブロック番号のパケットが紛れ込んできたときにはステップ９１３に移行する。

【００６９】ステップ９１２）　未受信であれば、受信パケットをブロックバッファ３２１に格納し、パケット管理テーブル３２２３に当該パケットが受信済を示す○を期す。

ステップ９１３）　既に受信済または、古いブロック番号のパケットが紛れ込んできたときには廃棄する。

【００７０】ステップ９１４）　配送開始／終了処理部３２２２は、ブロックのパケットが全て揃うか、配送開始を受信するか、タイムアウトかを判定する。

ステップ９１５）　ステップ９１４にいおいて、いずれかの終了条件を満たしたとき、１ブロックをアプリケーションバッファ３１１に渡す。アプリケーションバッファ３１１に適当にブロック数が蓄積されたとき、デコーダ３４０は、復号化及び外部のＡＶ出力機器３０１やデータベース３０２に出力していく。特に、複数ブロック数蓄積するのは、ＡＶ機器３０１に出力する場合に、ブロックがなくなって出力の途切れを生じさせないようにするためである。具体的な値は、アプリケーションバッファ３１１のサイズと入力から出力までの許される遅延等に依存する。次のブロックバッファを用意し、パケット管理テーブル３２２３をリセットする（パケットは全て未受信と記録する）。

【００７１】ここでは、ブロックバッファ１個の場合を説明したが、ブロックバッファを複数個用意することにより、引続き行われる次のブロック受信に予備のバッファで対処することができる。これにより、ＡＰバッファにブロックを渡す処理が受信処理のネックになることを回避できる。

【００７２】ステップ９１６）　配送終了通知を受信した場合には、ステップ９１８に移行し、未受信の場合は、ステップ９１７に移行する。

ステップ９１７）　配送開始通知待ちとなる。配送開始通知を受信するかタイムアウトすると、ステップ９０７に移行し、次のブロックのデータパケット受信待ちとなる。配送開始通知は複数個の場合もあるが、１個でも受信するとステップ９０７に移行する。

【００７３】ここで配送開始通知がネットワーク２００上等で紛失すると、次のブロックの配送がいきなり始まるが、ステップ９１５において既に準備されているため、次のブロックの受信は可能である。また、ステップ９１５の前で既に配送開始通知を受け取っている場合には、当該ステップ９１７の処理は行わない。

【００７４】ステップ９１８）　配送開始通知に対する

応答パケットをサーバに返し、受信終了する。この処理は、端末３００からの応答に基づいてサーバ１００が各端末３００に情報配送の成否を管理する場合に用いる。この応答を省略するような実装方法もある。

【００７５】なお、本発明は、上記の実施例に限定されることなく、特許請求の範囲内で種々変更・応用が可能である。

【００７６】

【発明の効果】上述のように本発明の連続データ配送方法及びシステムによれば、情報のような連続データについて、パケット単位のデータ受信の成否の記録を行うことにより、重複データ配送を効率的に実現できる。特に、パケットシーケンス番号の照合のみで、受信パケットの格納実行の判断を行うので、余分な格納領域やメモリ間のデータコピーが不要であり、効率的である。これにより、ネットワークのデータ伝送誤りの劣化や端末での一時的な受信性能劣化のため、データ損失が起きる場合でも、連続データを誤りなく高品質で多数の端末に対して配送することができる。

【００７７】本発明は、再送を行わないので、衛星を利用したデータ配送や、数万キロに及ぶ超長距離配送等のように伝送遅延が大きい場合に特に適用領域がある。

【図面の簡単な説明】

【図１】本発明の原理を説明するための図である。

【図２】本発明の原理構成図である。

【図３】本発明が適用されるシステム構成図である。

【図４】本発明のサーバの構成図である。

【図５】本発明のサーバの配送処理部の構成図である。

【図６】本発明のサーバのパケット管理テーブルの例である。

【図７】本発明の端末の構成図である。

【図８】本発明の端末の配送処理部の構成図である。

【図９】本発明の各端末のパケット管理テーブルの例である。

【図１０】本発明の連続配送の一連の動作を説明するための図である。

【図１１】本発明の一実施例のデータパケットのデータ構成図である。

【図１２】本発明の一実施例のデータパケットのデータ構成図である。

【図１３】本発明の一実施例の配送終了通知パケットのデータ構成図である。

【図１４】本発明の一実施例のサーバの配送手順のフローチャートである。

【図１５】本発明の一実施例の端末の配送手順のフローチャートである。

【図１６】従来の複数端末へのデータ配送シーケンスである。

【符号の説明】

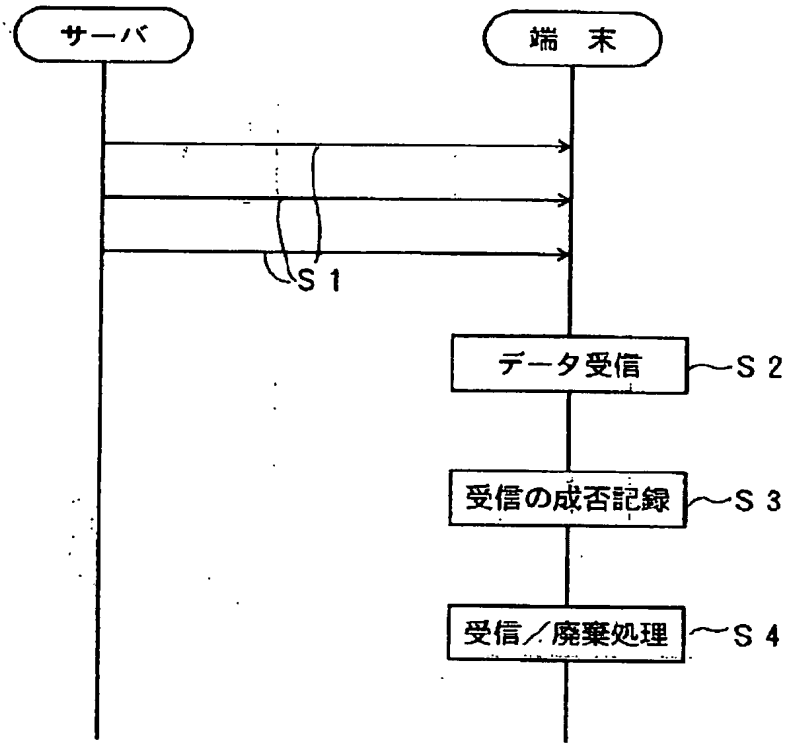
１００　サーバ
１０６　撮影機・マイク
１０７　エンコーダ
１０８　データベース
１１０　アプリケーション管理部、アプリケーション管理手段
１１１　アプリケーションバッファ
１１２　アプリケーション処理部
１２０　配送管理部、配送処理手段
１２１　ブロックバッファ
１２２　配送処理部
１３０　通信制御部
１４０　重複配送手段
１５０　配送完了通知手段
１６０　配送開始通知手段
２００　通信ネットワーク
３００　端末
３０１　ＡＶ出力機器
３０２　データベース
３１０　アプリケーション管理部、アプリケーション管理手段
３１１　アプリケーションバッファ
３１２　アプリケーション処理部
３２０　配送管理部
３２１　ブロックバッファ
３２２　配送処理部
３３０　通信制御部
３４０　デコーダ
３４１　デコードバッファ
３５０　成否記録手段
３６０　応答手段
３８０　パケット格納・破棄手段
６００　配送開始通知パケット
６０１　端末宛先
６０２　パケット種別
６０３　配送情報
６０５　ブロックサイズ
６０６　ブロック番号
１２２１　パケット配送処理部
１２２２　配送開始終了処理部
１２２３　パケット管理テーブル
３２２１　パケット配送処理部
３２２２　配送開始／終了処理部
３２２３　パケット管理テーブル
Ｄ００　データパケット
Ｄ０１　端末宛先
Ｄ０２　パケット種別
Ｄ０Ｂ　ブロック番号
Ｄ０Ｐ　パケット番号
Ｄ０３　ユーザデータ
Ｆ００　配送終了通知パケット

17　　18

Ｆ０１　端末宛先　　＊　＊Ｆ０２　パケット種別

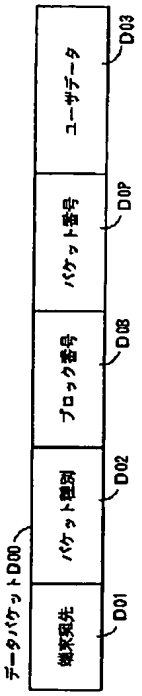
【図１】

本発明の原理を説明するための図



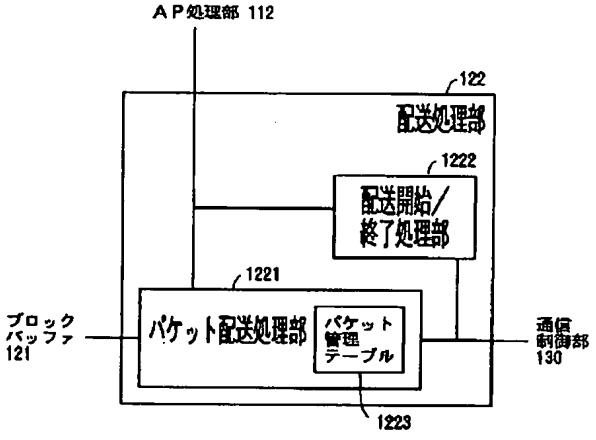
【図１２】

本発明の一実施例のデータパケットのデータ構成図



【図５】

本発明のサーバの配送処理部の構成図



【図６】

本発明のサーバのパケット管理テーブルの例

1223

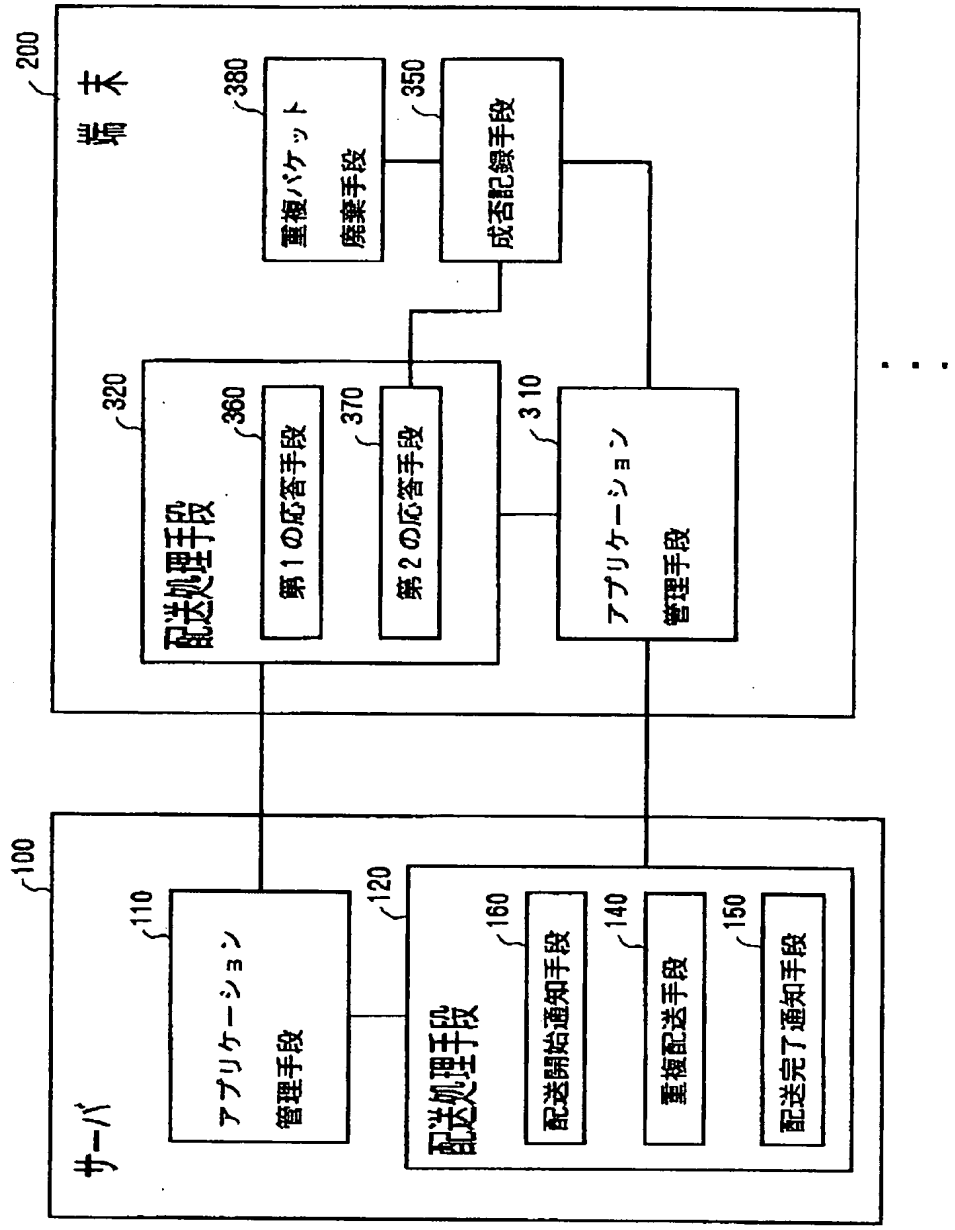
m：一つのブロックを
分割したパケット数

パケット番号 ⟶	1	2	3	4 ・・・・・		m
LOC	r1	r2	r3	r4		rk

LOC ri(i =1, 2, 3, ･･･, k) ：ブロックバッファの各パケット位置

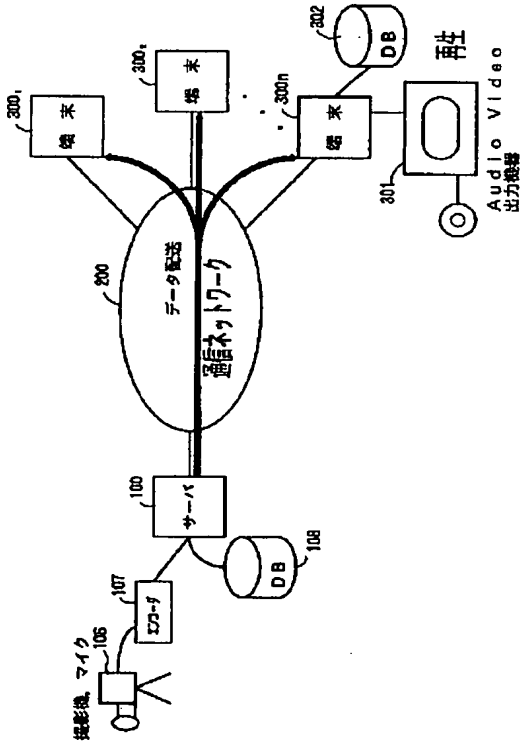
【図2】

本発明の原理構成図



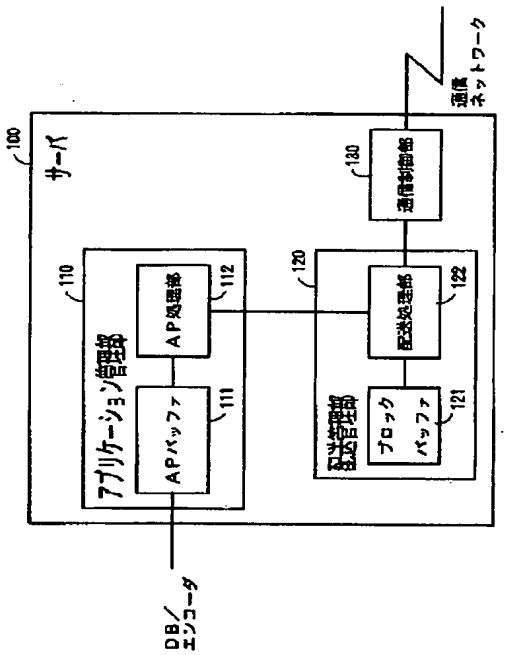
【図３】

本発明が適用されるシステム構成図



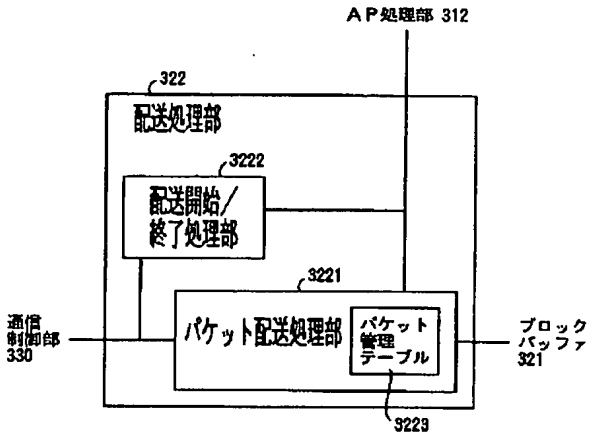
【図４】

本発明のサーバの構成図



【図８】

本発明の端末の配送処理部の構成図



【図９】

本発明の各端末のパケット管理テーブルの例

パケット番号 ⟶　　m：一つのブロックを分割したパケット数

	1	2	3	・・・・・		m
LOC	S1	S2	S3			Sk
済／未	○	○	×			○

LOC Si(i =1, 2, 3, … k) ：ブロックバッファの各パケット位置

○：パケット受信済み

×：パケット未受信

【図１３】

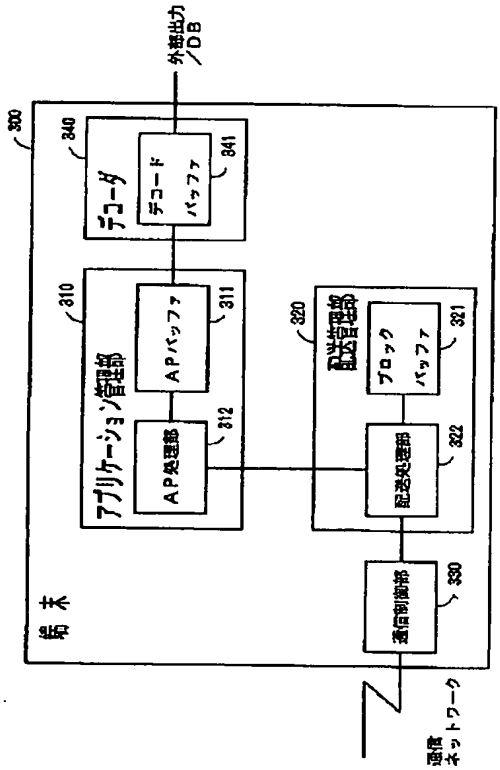
本発明の一実施例の配送終了通知パケットのデータ構成図

配送終了通知パケットF00

端末宛先	パケット種別
F01	F02

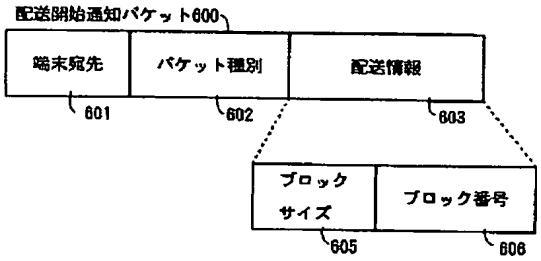
【図７】

本発明の端末の構成図



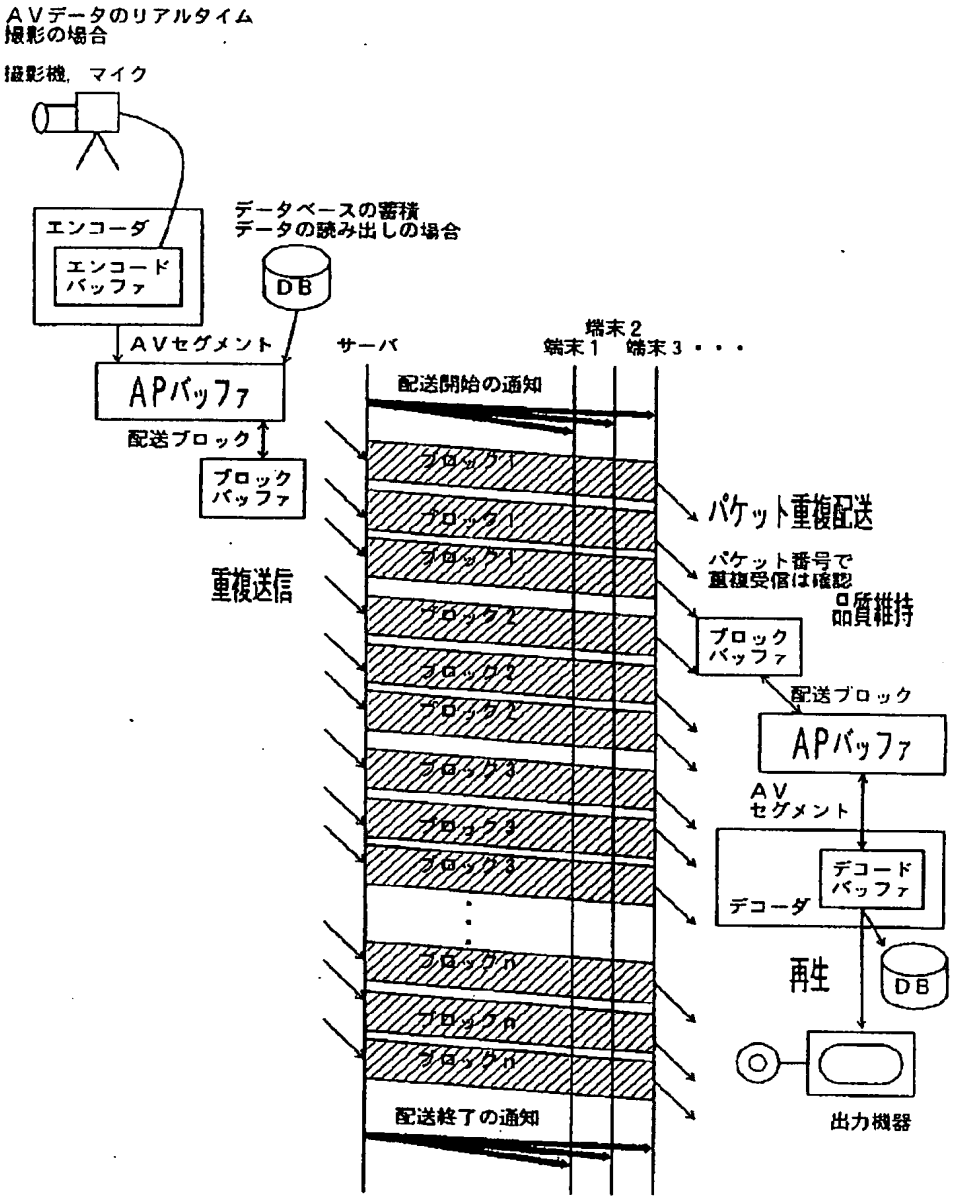
【図１１】

本発明の一実施例の配送開始通知パケットのデータ構成図



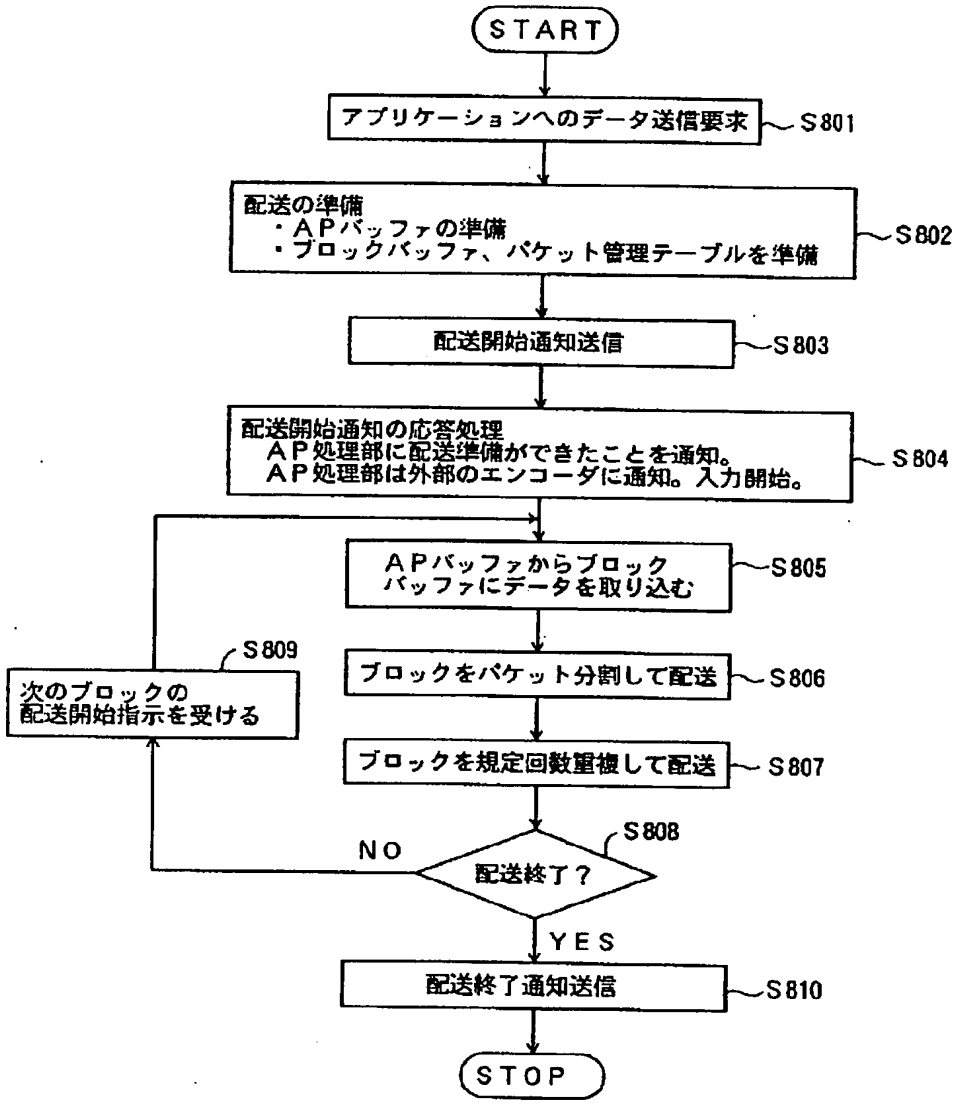
【図１０】

本発明の連続配送の一連の動作を説明するための図



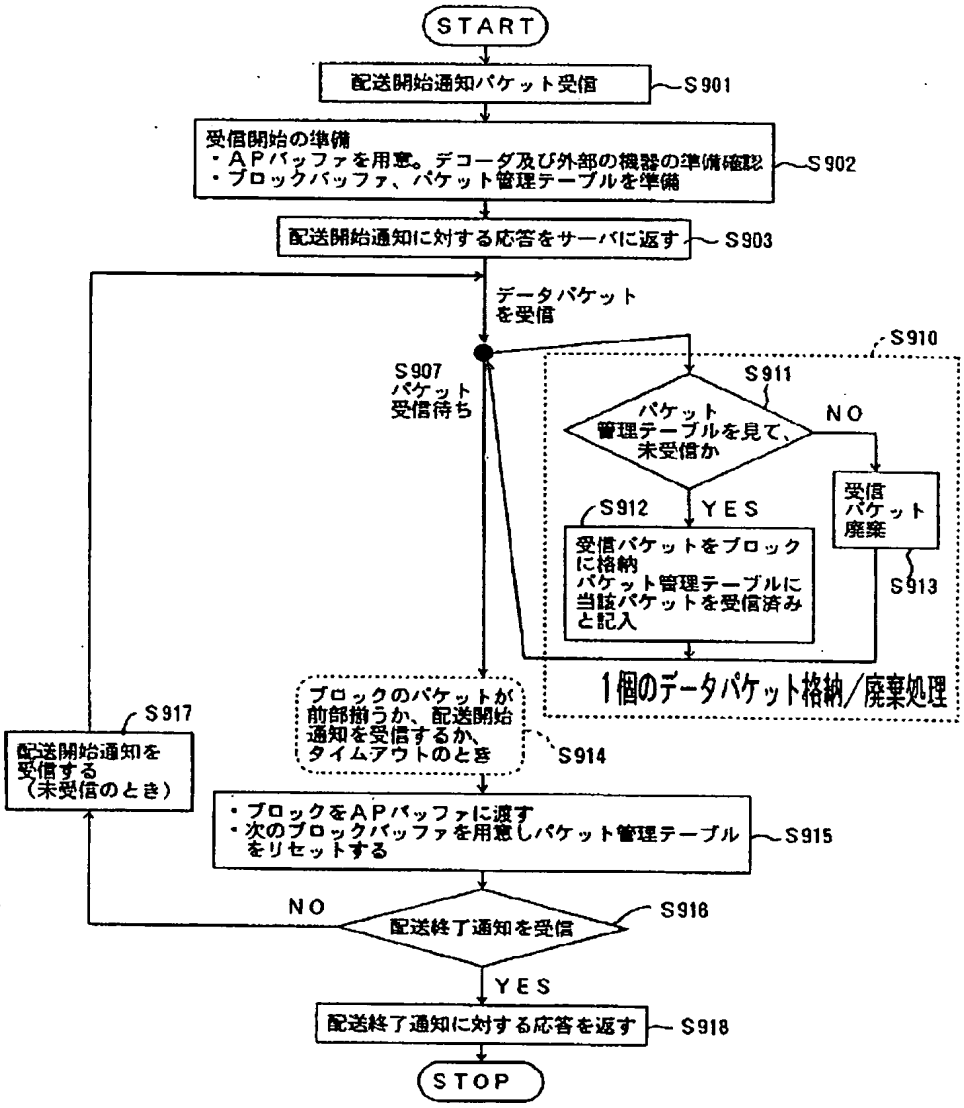
【図１４】

本発明の一実施例のサーバの配送手順のフローチャート



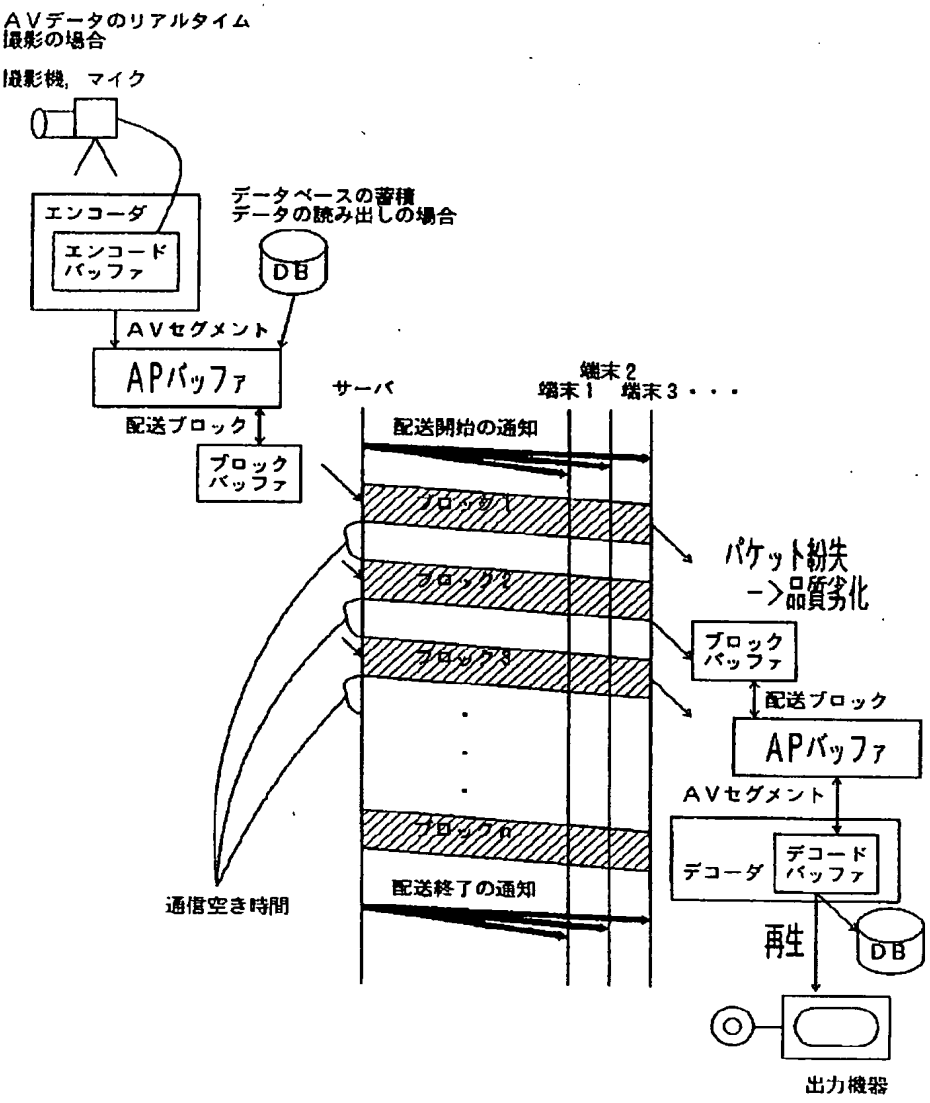
【図１５】

本発明の一実施例の端末の配送処理手順のフローチャート



【図１６】

従来の複数端末へのデータ配送シーケンス



CLAIMS

[Claim(s)]
[Claim 1] The continuation data delivery approach characterized by to compensate by consecutive Brock's data when the same Brock is transmitted to a multiple-times terminal and lack arises in the first-time Brock delivery through a communication network using the communication link idle time produced from a server in said server in the continuation data delivery approach which delivers information continuously to at least one terminal according to the difference of the coding rate of said information, and the transmitting rate of said communication network.
[Claim 2] Deliver to said terminal in the packet unit which subdivided the Brock unit and Brock who gave the sequence number for continuous data in said server, and it sets to said terminal. The data of said Brock unit delivered from said server and said packet unit are received. Based on the sequence number of the packet of the data of said packet unit, record the success or failure of reception of a data packet unit, and record of the success or failure of said reception and the sequence number of the packet which received just now are collated. The continuation data delivery approach which will carry out storing processing at the Brock buffer if this receiving data packet has not received before, and is characterized by discarding without storing if this receiving data packet is reception ending.
[Claim 3] The continuation data delivery approach according to claim 1 or 2 controlled so that prepare two or more Brock buffers, said information from the outside is preceded and read in said server, it stores in these two or more Brock buffers and the opening of the Brock delivery to said terminal does not arise.
[Claim 4] The continuation data delivery approach according to claim 2 which returns a response to said server in said terminal only to the notice of delivery initiation which received at the very beginning of data delivery when the notice of delivery initiation is received from said server.
[Claim 5] A communication network and the server connected through this communication network, It is the continuation data delivery system which consists of at least one terminal which has data continuously delivered through this communication network from this server. The continuation data delivery system characterized by consisting of servers and terminals including the application management tool which manages delivery/reception of the continuation data divided per Brock, and the delivery processing means which divides said Brock into a packet and carries out delivery processing per packet.
[Claim 6] The delivery processing means of said server is a continuation data delivery system including a duplication delivery means to overlap to a terminal and to deliver in the Brock unit which gave the sequence for continuous data, and the packet unit which subdivided Brock according to claim 5.
[Claim 7] Said terminal is a continuation data delivery system according to claim 5 which will carry out storing processing if the data packet which received has not received before with reference to a success-or-failure record means to record the success or failure of reception of a data packet unit based on said sequence number, and said success-or-failure record means, and includes a packet storing / cancellation means to cancel if it is a data packet [finishing / reception].
[Claim 8] The delivery processing means of said server is a continuation data delivery system according

to claim 5 included in a notice means of delivery initiation to deliver the notice packet of delivery initiation to said terminal in advance of the next Brock delivery at the very first of data delivery, and ** of delivery of Brock, and a notice means of the completion of delivery to deliver the notice packet of the completion of delivery to said terminal at the time of completion of delivery.

[Claim 9] The delivery processing means of said terminal is claim 5 which includes a response means to return a response to said server only when said notice of delivery initiation is received from said server and the notice of delivery initiation concerned is a notice of the very first of data delivery, and a continuation data delivery system given in seven.

[Claim 10] Said delivery processing means of said server is a continuation data delivery system including the 1st precedence storing means which has two or more Brock buffers, precedes reading from the application buffer of said application management tool, and is stored in this block buffer according to claim 5.

[Claim 11] Said application management tool of said terminal is a continuation data delivery system including the 2nd precedence storing means which has two or more application buffers, precedes reading from the Brock buffer of said delivery management tool, and is stored in this application buffer according to claim 5.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the continuation data delivery approach and a system, delivers to a terminal AV (Audio-Visual) information under photography, the alphabetic character and the numerical information (it is called sequence-code information below) which was inputted by suitable frequency in succession and coded according to a specific format, the AV information stored in the mass database, and sequence-code information, and relates especially to the continuation data delivery approach and the system which offer the continuation data which reproduce immediately.
[0002] Moreover, this invention is applied also to a system which stores in a mass database the receipt information which received from the server, and reuses it in a terminal.
[0003]
[Description of the Prior Art] There is a method of only transmitting delivery data from a server to two or more terminals as a delivery technique of the conventional continuation data at the time of delivery of data. For example, although what is performed in the MBONE experiment of the Internet is known, this uses multicast delivery (delivery to a terminal group). Since data are only only delivering in this delivery approach, processing to lack data is not performed.
[0004] Drawing 16 shows the data delivery sequence to conventional two or more terminals. In this drawing, the buffer used for a communication link is the Brock buffer. As for processing of informational coding/decryption, processing is performed in an encoder/decoder. Furthermore, AP buffer is formed as a middle buffer between coding/decryption, and communicative processing. Conventionally, there are some which do not use an application buffer.
[0005] In drawing 16 , if photography using a motion picture camera or a microphone of the real time of AV data is performed, it will be accumulated in an encoding buffer, AV segmentation will be carried out, and those AV data will be stored in an application buffer. When delivering this from a server to a terminal, it divides into a Redirection block, accumulates in the Brock buffer, and is delivered by two or more terminals for every Brock at the time of delivery.
[0006] In a terminal side, Brock who received from the server is accumulated in the Brock buffer, it is accumulated in an application buffer for every Redirection block, and output equipment is reproduced by decoding. In the case of sequence-code information, it processes carrying out graphical representation of the numeric value etc., and may be displayed on output equipment.
[0007] Moreover, there is also the approach of delivering serially the data only given as a conventional method, without blocking as it is. Data are delivered only once, without using, even when communication link idle time arises conventionally also in which method of transmitting the delivery or data based on blocking as it is.
[0008] In addition, a packet is [several M bytes and AV segment of about 1 K byte and Brock] about hundreds of bytes in magnitude.
[0009]
[Problem(s) to be Solved by the Invention] However, at a terminal, as shown above, when loss arises to

delivery data for the reason of the buffer having overflowed in the transmission error of the data on a network, or loss or an accepting station conventionally, since it is reproduced been missing, the quality of Redirection Information deteriorates. It has deteriorated, when received data were stored in a database at a terminal and it received.

[0010] Therefore, by the above-mentioned conventional method, since [of delivery data] it cannot be coped with to lack in part, the quality of receipt information deteriorates to network quality degradation or data loss with a terminal, and there is a problem of information playback of high quality becoming impossible. Even when it was made in view of the above-mentioned point and a data loss happens about continuation data like information or sequence-code information for degradation of a network data transmission error, or temporary receiving performance degradation in a terminal, this invention mistakes continuation data and aims at offering the continuation data delivery approach and system which can be delivered to many terminals. [there is nothing, and it is quality and]

[0011]

[Means for Solving the Problem] This invention is compensated by consecutive Brock's data, when the same Brock is transmitted to a multiple-times terminal and lack arises in the first-time Brock delivery through a communication network using the communication link idle time produced from a server according to the difference of an informational coding rate and the transmitting rate of a communication network in a server in the continuation data delivery approach which delivers information continuously to at least one terminal.

[0012] Drawing 1 is drawing for explaining the principle of this invention. Deliver this invention to a terminal in the packet unit which subdivided the Brock unit and Brock who gave the sequence number for continuous data in the server (step 1), and it is set to a terminal. The data of said Brock unit delivered from the server and said packet unit are received (step 2). Based on the sequence number of the packet of the data of a packet unit, record the success or failure of reception of a data packet unit (step 3), and record of the success or failure of reception and the sequence number of the packet which received just now are collated. If this receiving data packet has not received before, storing processing will be carried out at the Brock buffer (step 4), and if this receiving data packet is reception ending, it will discard, without storing (step 4).

[0013] Moreover, in a server, this invention prepares two or more Brock buffers, precedes and reads the information from the outside, stores it in these two or more Brock buffers, and it is controlled so that the opening of the Brock delivery to a terminal does not arise. Moreover, in a terminal, when this invention receives the notice of delivery initiation from a server, it returns a response to a server only to the notice of delivery initiation which received at the very beginning of data delivery.

[0014] Drawing 2 is the principle block diagram of this invention. The server to which this invention is connected through a communication network and this communication network, It is the continuation data delivery system which consists of at least one terminal which has data continuously delivered through this communication network from this server. It consists of servers 100 and terminals 300 including the application management tools 110 and 310 which manage delivery/reception of the continuation data divided per Brock, and the delivery processing means 120 and 320 which divide Brock into a packet and carry out delivery processing per packet.

[0015] Moreover, the delivery processing means 120 of the above-mentioned server 100 includes a duplication delivery means 140 to overlap to a terminal and to deliver in the Brock unit which gave the sequence for continuous data, and the packet unit which subdivided Brock. Moreover, the above-mentioned terminal 300 will carry out storing processing, if the data packet which received has not received before with reference to a success-or-failure record means 350 to record the success or failure of reception of a data packet unit based on a sequence number, and the success-or-failure record means 350, and it includes a packet storing / cancellation means 380 to cancel if it is a data packet [finishing / reception].

[0016] Moreover, the delivery processing means 120 of the above-mentioned server 100 contains a notice means 160 of delivery initiation to deliver the notice packet of delivery initiation to a terminal in advance of the next Brock delivery at the very first of data delivery, and ** of delivery of Brock, and a

notice means 150 of the completion of delivery to deliver the notice packet of the completion of delivery to a terminal at the time of completion of delivery.
[0017] Moreover, the delivery processing means 320 of the above-mentioned terminal 300 includes a response means 360 to return a response to a server 100, only when the notice of delivery initiation is received from a server and the notice of delivery initiation concerned is a notice of the very first of data delivery. Moreover, the delivery processing means 120 of a server 100 has two or more Brock buffers, precedes reading from the application buffer of an application management tool, and includes the 1st precedence storing means stored in this block buffer.
[0018] Moreover, the application management tool 310 of a terminal 300 has two or more application buffers, precedes reading from the Brock buffer of the delivery management tool 320, and includes the 2nd precedence storing means stored in this application buffer.
[0019] As mentioned above, in case information is continuously delivered from a server to two or more terminals through a communication network, this invention transmits the same Brock to a multiple-times terminal using the communication link idle time produced according to the difference of an informational coding rate and the transmitting rate of a communication network, and since it transmits Brock of multiple-times identitas even if it is the case where lack arises in the first-time Brock delivery, it can compensate him by the data of the Brock concerned.
[0020] This invention moreover, by recording the success or failure of reception of a data packet unit by the terminal side based on the sequence number of the packet of the data of a packet unit which received from the server It is possible to complement lack, loss, etc. of Brock certainly by storing and carrying out reception to the Brock buffer, if the data packet which received has not received with reference to record of the success or failure of reception, and performing processing discarded without storing, if the data packet concerned is reception ending. Since data storage is especially judged only by enquiry of a packet sequence number, even if it performs duplication reception, the data copy between an excessive storing field or memory is unnecessary.
[0021] Moreover, the opening of the Brock delivery to a terminal does not produce this invention by preparing two or more Brock buffers, preceding and reading the information from the outside in a server, and storing in these two or more Brock buffers. Moreover, in a terminal, when this invention receives the notice of delivery initiation from a server By returning a response to a server, omitting the response in the notice of delivery initiation after the 2nd Brock only to the notice of delivery initiation of the beginning of data delivery, overlapping also about the notice of delivery initiation concerned, and transmitting to a terminal While aid is given like the above, it becomes possible to shorten the communication link time amount of the whole data.
[0022] Moreover, in a terminal, when this invention receives the notice of the completion of delivery from a server, it becomes possible [using as accounting information to the data received by the terminal side] by transmitting record of the success or failure of reception to a server.
[0023]
[Embodiment of the Invention] Drawing 3 shows the system configuration to which this invention is applied. As for the communication system of the information shown in this drawing, the encoder 107 which encodes the information acquired from the motion picture camera and the microphone 106, and the database 108 which accumulates encoded AV information or sequence-code information are connected to a server 100. Sequence-code information may be serially stored in the database from the exterior.
[0024] moreover, each terminal 3001 and 3002, --, 300n **** -- the output equipment 301 and the database 302 which carry out the playback output of the decoded information are connected. Moreover, a server 100, two or more terminals 3001, and 3002, --, 300n It connects with the communication network 200 of a cable or wireless, the communication network 200 concerned is minded, and they are each terminal 3001 and 3002, --, 300n from a server 100. Data delivery is carried out.
[0025] It encodes with an encoder 107 and the information inputted with the motion picture camera and the microphone 106 is incorporated by the server 100. Information is beforehand stored in the mass database 108, and may be incorporated by the server 100 from there. In a terminal 300 side, the

information delivered from the server 100 is immediately outputted to the output equipment 301, such as a monitor and a loudspeaker. Receipt information may be stored in a database 302 at a terminal 300. The above is the example of use of the usual continuation data delivery service.

[0026] Drawing 4 shows the configuration of the server of this invention. The server 100 shown in this drawing consists of the application Management Department 110, the delivery Management Department 120, and the communications control section 130. The application Management Department 110 has the application process section 112 which carries out division management of the continuation data of the application buffer 111 and the application buffer 111 concerned at Brock. The delivery Management Department 120 has the delivery processing section 122 which requires next Brock of the application process section 112, whenever it performs data transfer of the Brock unit of the Brock buffer 121 and the Brock buffer 121 concerned, and the subdivided packet unit and one Brock delivery finishes.

[0027] Drawing 5 shows the configuration of the delivery processing section of the server of this invention. The delivery processing section 122 consists of the packet delivery processing sections 1221, and the delivery initiation / post process sections 1222 containing the packet managed table 1223. The packet delivery processing section 1221 carries out division delivery of Brock per packet, and manages the success or failure of the delivery concerned in the packet managed table 1223. Delivery initiation / post process section 1222 manages about initiation and termination of packet delivery.

[0028] Drawing 6 shows the example of the packet managed table of the server of this invention. The packet managed table 1223 shown in this drawing manages each packet location of the Brock buffer 121 for every packet number. As shown in this drawing, as for the packet managed table 1223, the storing location on memory also specifies the sequence number (packet number) for each [allocation and] packet of every for every packet. Although a program mounting top establishes the packet storing region of a fixed size in number correspondence, it is not explicitly expressed to the storing location on memory in many cases.

[0029] Drawing 7 shows the configuration of the terminal of this invention. The terminal 300 shown in this drawing has the application Management Department 310, the delivery Management Department 320, the communications control section 330, and a decoder 341. The application Management Department 310 has the application process section 312 and the application buffer 311, acquires the information passed from the delivery Management Department 320, and stores in the application buffer 311.

[0030] The delivery Management Department 320 has the delivery processing section 322 and the Brock buffer 321, and the delivery processing section 322 performs reception of data per the Brock unit and subdivided packet from a server 100 through the communications control section 330, and passes a receiving block to the application process section 311 of the application Management Department 310 for every completion of the Brock reception.

[0031] A decoder 340 is outputted to an external AV output or a database 302 while it decodes the encoded information which was passed from the application Management Department 310 and accumulates it in the decoding buffer 341. Drawing 8 shows the configuration of the delivery processing section of the terminal of this invention. The delivery processing section 322 has the packet delivery processing section 3221, and the delivery initiation / post process section 3222 containing the packet managed table 3223.

[0032] As shown in drawing 9 , for every packet number which received, the packet managed table 3223 shows each packet location of the Brock buffer 321, and manages a receiving settled one or un-receiving for every packet concerned further. Thus, the packet managed table 3223 of a terminal 300 also has the field which records received [packet]/un-receiving for every packet for every packet. Although Ox shows success or failure in this drawing, they are expressed on mounting by 1 bit of Bit ON (= 1) or Bit OFF (= 0). A packet sequence number is an integer, and when 10-M byte Brock is divided into the packet of 1-K byte length, it becomes from No. 1 to No. 10000. The format of a storing location follows the usual format of being used in each computer system or the programming language which describes a table.

[0033] Next, a series of outline actuation of the above-mentioned configuration is explained. Drawing

10 is drawing for explaining a series of actuation of continuation delivery of this invention. If a delivery demand is received from the exterior, the application process section 112 will divide the data of the application buffer 111 into Brock, and will notify the notice of delivery initiation to a terminal 300.
[0034] In delivery initiation / post process section 3222 of the delivery processing section 322 of a terminal 300, if the notice of delivery initiation is received, the delivery Management Department 322 of a terminal 300 prepares the Brock buffer 321, and the application process section 312 will prepare the application buffer 311 and the Brock managed table 3223, and it will prepare reception.
[0035] The application process section 112 of a server 100 passes data to the delivery processing section 122 per Brock. In the delivery processing section 122, the Brock buffer 121 is prepared and multiple-times Brock transmission is performed. This drawing shows 3 times of examples for this count of duplication.
[0036] A terminal 300 stores the packet in the Brock buffer 321, if a data packet is received in the communications control section 330 and it will not have received with reference to the packet managed table 3223 (when the packet concerned is received for the first time). If it is already receiving settled, the packet concerned will be discarded without storing.
[0037] The receiving success percentage of a loss packet can be raised by actuation of this terminal 300. Moreover, since an existing receive packet is discarded immediately, its data copy between an excessive storing field or memory is unnecessary. Detection of the bit error error of a packet and abandonment of an error packet are performed in connection processing with a network, transfer processing of a packet, and a list in a server 100 and the communications control sections 130 and 330 of a terminal 300.
[0038] Thus, in this invention, the same Brock is delivered to multiple-times (this drawing 3 times) each terminal 300. Duplication reception of Brock is carried out at a terminal 300. Although mentioned later, in the delivery 2nd after the same Brock, only a non-receive packet is stored in the block buffer 321, and an existing receive packet is canceled immediately.
[0039] In addition, although this drawing shows the case where duplication delivery is 3 times, according to the difference of the data transmitting rate which can be used in coding and an informational decryption rate, and an informational network 200, there are 2 times of cases and there are also 4 times or more of cases further. Thus, in a server 100, by using the idle time of the following new Brock delivery after the Brock delivery for duplication delivery, and performing duplication reception in a terminal 300 based on a packet sequence number, this invention can realize efficient redundant data delivery, and can aim at improvement in the quality of received data.
[0040] Moreover, multicast transmission (broadcast of data which specified the group) to two or more terminals is realizable by using OS (operating system) in which a multicast communication link is possible. That is, it is UDP (User Datagram Protocol) as a server 100 and the communications control sections 130 and 330 of a terminal 300. And IP (Internet Protocol) It is realizable by using OS in which protocol processing is possible. Especially, OS which can process the group address (class D address) of IP is used. In processing of UDP, detection of the bit error of a receive packet and abandonment of a bit error packet are also included.
[0041] Moreover, commercial production (LSI, communication board) of the encoder and decoder based on a coding approach MPEG standardization of the low bit rate in high efficiency and the approach of MPEG progresses as an informational coding technique, and it is becoming available by one side a high-speed network technique [like a Frame Relay or ATM] whose network is also. This invention uses for duplication delivery the idle time of the data delivery produced such a low bit rate information coding technique and by using a high-speed network. Moreover, duplication delivery can be more nearly similarly performed by using a high-speed network with low bit rates, such as an alphabetic character and numerical information, also about the sequence-code information which can be encoded. Here, the decoder of the same decode rate as the encoder which also uses an informational decryption for coding is usually used.
[0042] The example of coding and a decryption rate is shown below.
MPEG1:1.5 Mb/s Extent;
MPEG2:6 Mb/s Extent;

MPEG4:64 Kb/s Extent;
Character code: 6.4 Kb/s Extent (in the case of 400 characters/[s and] and a 2 byte code): The example of a network transmission speed is shown below.
ATM:156 Mb/s and 622 Mb/s : Ethernet LAN:10 Mb/s and FDDI-LAN:150 Mb/s : High-speed dedicated line and Frame Relay:1.5 Mb/s and 6 Mb/s etc. -- : [0043]
[Example] Hereafter, the example of this invention is explained with a drawing. First, the server 100 and terminal 300 which are shown in drawing 4 and drawing 7 are explained. A server 100 and a terminal 300 have the application buffers 111 and 311 to the application Management Department 130 and 330, and the application process section 112 passes delivery data to the delivery processing section 122 per Brock in a server 100. It has the Brock buffer 121 to the delivery Management Department 120, and in a server 100, the delivery processing section 122 divides Brock of the Brock buffer into a data packet, and performs data delivery through the communications control section 130.
[0044] At the terminal 300, it judges [to which the delivery processing section 322 receives the data packet which received through the communications control section 330 / or or] whether abandonment is carried out, and stores in the Brock buffer 321. By the opportunity, like a packet gathers altogether, the data block which received is stored in the application buffer 311 through the application process section 322.
[0045] The application buffers 111 and 311 have 121 or 321 or more Brock buffers magnitude. In the server 100 side, it is consumed in the Brock unit through the application process section 112 by the order in which AV segment passed from the encoder 107 is serially accumulated, and data (AV segment) were stored for delivery.
[0046] In the terminal 300 side, Brock who received from the delivery processing section 122 of a server is serially accumulated in the application buffer 311 through the delivery processing section 322 and the application process section 312, and it is consumed by the accumulated order per AV segment for an external output or the are recording to a database 302.
[0047] In this example, an encoder 107 is set to the exterior of a server 100, and a decoder 340 considers it as the configuration prepared in the terminal 300 interior. Of course, an encoder 107 is possible also for the configuration in which an one configuration with a server 100 and a decoder 340 are formed in the exterior of a terminal 300.
[0048] Usually, the configuration which became independent since the load of processing of the direction of an encoder 107 was large is taken in many cases, and since commercial production progresses and a decoder 340 is incorporated in a terminal as LSI or a board in many cases, it is taken as the configuration shown in drawing 7 . In case delivery is started from a server 100 to a terminal 300, in advance of data delivery, the notice packet of delivery initiation is delivered from delivery initiation / post process section 1222 of the delivery processing section 122 of a server 100.
[0049] Drawing 11 shows the configuration of the notice packet of delivery initiation of one example of this invention. This is notified to a terminal 300 from a server 100 in advance of the next Brock delivery for every very first of data delivery, and delivery of Brock. To two or more terminals, it shall carry out by the multicast for effectiveness. the next Brock delivery initiation is boiled by way of precaution, and the 2nd notice more than packet of delivery initiation performs it, in order to tell a terminal 300. A terminal 300 can obtain the opportunity of completion of the Brock delivery of one batch, and the next Brock reception preparation also by the time-out of reception by the time of completing the packet reception for 1 Brock, and 1 Brock.
[0050] A packet ID 602 which shows the classification (it is a notice packet of delivery initiation) of the terminal destination 601 and a packet, and Redirection Information 603 are consisted of by the notice packet 600 of delivery initiation shown in this drawing. A block size 605 and the Brock delivery contain in Redirection Information 603 the block number 606 which shows what position.
[0051] About the code length of a block number 606, if it encodes by 16 bits, it can express to 65536 pieces by the 16th power of 2, and can treat to about 655.36 G bytes by 10-M byte Brock. If it encodes by 32 bits, it can express to 4, 294, and 967 or 29 pieces by the 32nd power of 2, and can treat to abbreviation 42949.6Tbyte by 10-M byte Brock. When short 100-K byte Brock is used, and a block

number 606 is encoded by 16 bits and 32 bits, the data volume to about 6.55 G bytes and about 429 Tbyte(s) can be treated, respectively, and it is satisfactory practically.
[0052] I have a response returned from a terminal to the notice packet of delivery initiation delivered from the server 100 for a check. However, although delivered at the time of delivery initiation and Brock's head delivery, returning and getting a response from a terminal 300 considers only as the time of delivery initiation, and, as for the notice packet of delivery initiation, it does not perform this response waiting by delivery of Brock other than an intermediate head. Instead, in order to overlap and to transmit a notice packet, it is effective in notice packet loss in a network etc. If a block size also uses a fixed value, the block size notified by the first-time notice packet of delivery initiation will be used fixed.
[0053] Drawing 12 shows the data configuration of the data packet of one example of this invention. The data packet shown in this drawing is a packet which divides and sees off Brock in a terminal 300 from a server 100. A data packet D00 consists of the terminal destination D01, the packet classification D02, packet number D0B, packet number D0P, and user data D-3. In two or more destination delivery, the group address is used for the terminal destination D01. It is shown in the packet classification D02 that it is a data packet. The block number (sequence number) of the notice packet of delivery initiation shown in drawing 11 is set as block number D0B. The sequence number of the packet concerned is encoded by packet number D0P. The data which divided Brock are set to the user data division D03.
[0054] Here, the block number is used for judging this packet with a block number and discarding it, when the packet of Brock before the receiving block concerned whom reception has already completed has been lost while receiving a series of data packets at a terminal 300.
[0055] Drawing 13 shows the configuration of the notice packet of the completion of delivery of one example of this invention. The notice packet F00 of the completion of delivery has the packet classification which indicates it to be the terminal destination F01 that it is the notice of the completion of delivery. In the delivery to two or more terminals, the group address is used to the terminal destination F01.
[0056] Based on drawing 14 and drawing 15 , the server 100 of this example and actuation of a terminal 300 are explained below. Drawing 14 is the flow chart of the delivery procedure of the server of one example of this invention.
Step 801 Directions of data delivery are performed from the exterior of a server 100 to the application process section 112 of a server 100. At this time, the group of a terminal 300 and the continuation data which should be transmitted are specified.
[0057] Step 802 As for a server 100, the application buffer 111 is prepared for the application Management Department 110 as preparation of delivery initiation. At the delivery Management Department 120 of a server 100, the packet managed table 1223 in the packet delivery processing section 1221 is prepared according to the Brock buffer 121 and a block size, and a packet size. This block buffer 121 is premised on the field which took into consideration a server 100 and the available memory size of each terminal 300 beforehand being secured on memory.
[0058] Step 803 The application process section 112 directs initiation of delivery in the delivery processing section 122. Thereby, delivery initiation / post process section 1222 generates the notice packet 600 of delivery initiation, and transmits to a terminal 300 by the multicast.
Step 804 Delivery initiation / termination section 1222 stands by that the response from each terminal over the notice packet of delivery initiation gathers. When all responses from a terminal 300 gather, or when the time limit comes by the time-out, the member of the terminal 300 which delivers is decided. This member is the range of a group specified at step 801. Moreover, at this time, a server 100 is notified to the external encoder 107, and the input and coding of the information from the outside start. The encoded continuation data are serially stored in the application buffer 111.
[0059] Step 805 To the Brock buffer 121 of the delivery Management Department 120, 1 Brock is incorporated from the application buffer 111.
Step 806 The delivery Management Department 120 does packet division, and delivers 1 Brock of the Brock buffer 121. To two or more terminals, it delivers through the communications control section 130 using a multicast.

[0060] Step 807 Only the count of a convention of the same Brock carries out duplication delivery of the delivery Management Department 120 further.
Step 808 It judges whether there is the next Brock delivery succeedingly or there is nothing. Termination is notified from the application process section 112, or delivery initiation / post process section 1222 judges termination of delivery by the time-out. In termination, it shifts to step 810, and shifts to step 809 at the time of continuation.
[0061] Step 809 In continuation, delivery initiation / post process section 1222 increments a block number, sends the notice packet 600 of delivery initiation, notifies that next Brock's delivery is succeedingly carried out to each terminal, shifts to step 805, and shifts to next Brock's delivery. Unlike processing of step 803 in which the first notice is performed, at this time, the response from a terminal 300 shortens the time amount to the next Brock resending by not standing by but shifting to the next resending immediately. In this case, two or more notice packets of delivery initiation can cope with it to loss of the notice packet in network superiors by sending to each terminal.
[0062] Step 810 In next Brock's delivery initiation directions termination, delivery initiation / post process section 1222 generates the notice packet F00 of delivery termination, and delivers it to a terminal 300. In the case of two or more terminals, it delivers using a multicast. The success or failure of reception of each terminal 300 are recordable by forming the procedure of the response from each terminal 300 here. This record is effective on management, when performing accounting to information delivery. Of course, the procedure in which a response is not performed from a terminal 300 can be mounted only by the notice to a terminal 300 from a server 100. Processing is ended, when all responses are received or it becomes a time-out.
[0063] Although the above processing was explained using the example in which one Brock buffer 121 is formed, it is also possible to prepare two or more Brock buffers and to carry out by preceding reading to the spare Brock buffer 121 from the application buffer 111. It is possible to control so that the opening of transmission does not arise by this for processing of step 805.
[0064] Next, the procedure of the terminal 300 corresponding to the delivery procedure of a server 100 is explained. Drawing 15 is the flow chart of the delivery procedure of the terminal of one example of this invention.
Step 901 In delivery initiation / post process section 3222 of the delivery processing section 322, a terminal 300 will be notified to the application process section 312, if the notice packet 600 of delivery initiation delivered from the server 100 is received.
[0065] Step 902 In the application process section 312, if the notice of delivery initiation is received, the application buffer 311 will be prepared and preparation will be checked in a decoder 340 and the external output unit 301, and a database 302. At the delivery Management Department 320, the Brock buffer 321 and the packet managed table 3223 of block soybeans of Redirection Information 603 are prepared. The packet managed table 3223 is decided by the block size and the packet size. In this example, a block size is notified by the notice packet 600 of delivery initiation, and it assumes that the packet size is beforehand decided by the system.
[0066] Step 903 The delivery processing section 322 of a terminal 300 returns the response to the notice of delivery initiation to a server 100. .
Step 907 After receiving the notice of delivery initiation, it will be in the state waiting for packet receiving. If a data packet is received, it will shift to the reception of one data packet of step 910. If the time-out of whether 1 Brock's packet receives the notice packet of delivery initiation [altogether] is carried out with the waiting for a data packet, it will shift to step 920.
[0067] Step 910 The following steps 911, 912, and 913 explain storing/abandonment processing of one data packet. At the step concerned, all of a deed and the 1st Brock can also exclude processing of collating of the packet managed table 3223 by carrying out reception in delivery of each block to Brock of the first time not overlapping only to duplication Brock after the 2nd duplicate piece. In this case, the 1-bit field for distinction after the 2nd piece can be prepared and set in a packet configuration, and ** is good for one data packet.
[0068] Step 911 It judges whether the packet concerned of the packet managed table 3223 has received

by using the packet number of one packet which received as a key (did you begin this time and receive?). When having not received, it shifts to step 912, and when having already received, it shifts to step 913. Moreover, at this time, the block number of a packet is also checked, and when the packet of an old block number has been lost, it shifts to step 913.
[0069] Step 912 It is term ** about O with which store a receive packet in the Brock buffer 321, and the packet concerned indicates a receiving settled one to be to the packet managed table 3223 if it has not received.
Step 913 It discards, when the packet of a finishing reception already or old block number has been lost.
[0070] Step 914 Delivery initiation / post process section 3222 judges whether they are whether Brock's packet receives delivery initiation [altogether] and a time-out.
Step 915 1 Brock is passed to the application buffer 311, when were, it sets to step 914 and one of terminating conditions is fulfilled. When the block count is accumulated suitably for the application buffer 311, the decoder 340 is outputted to the decryption, and the external AV output equipment 301 and an external database 302. It is for Brock's dying and making it not produce the way piece of an output especially to carry out two or more block number are recording, when outputting to AV equipment 301. It depends for a concrete value on the delay allowed from the size and the input of the application buffer 311 to an output. The following Brock buffer is prepared and the packet managed table 3223 is reset (all packets record un-receiving).
[0071] Here, although the case of one Brock buffer was explained, the next Brock reception performed succeedingly can be coped with with a spare buffer by preparing two or more Brock buffers. It is avoidable that the processing which passes Brock to AP buffer becomes the neck of reception by this.
[0072] Step 916 When the notice of delivery termination is received, it shifts to step 918 and, in not receiving, shifts to step 917.
Step 917 It becomes the waiting for the notice of delivery initiation. If the time-out of whether the notice of delivery initiation is received is carried out, it will shift to step 907 and will become next Brock's data packet receiving waiting. Also in two or more cases, the notice of delivery initiation is, but if at least one piece receives, it will shift to step 907.
[0073] If the notice of delivery initiation is lost in network 200 superiors here, next Brock's delivery will start suddenly, but since it is already prepared in step 915, reception of next Brock is possible. Moreover, when the notice of delivery initiation is already received in front of step 915, processing of the step 917 concerned is not performed.
[0074] Step 918 The response packet to the notice of delivery initiation is returned to a server, and reception termination is carried out. This processing is used when a server 100 manages the success or failure of information delivery to each terminal 300 based on the response from a terminal 300. There is also the mounting approach that this response is omitted.
[0075] In addition, modification and application are variously possible for this invention within the limits of an application for patent, without being limited to the above-mentioned example.
[0076]
[Effect of the Invention] According to the continuation data delivery approach and system of this invention, redundant data delivery is efficiently realizable as mentioned above by recording the success or failure of data reception of a packet unit about continuation data like information. Since it is only collating of a packet sequence number and storing activation of a receive packet is judged especially, the data copy between an excessive storing field or memory is unnecessary, and efficient. Thereby, even when a data loss breaks out for degradation of a network data transmission error, or temporary receiving performance degradation in a terminal, continuation data are mistaken, and it is [that there is nothing] quality and can deliver to many terminals.
[0077] Since this invention does not resend, especially when a transit delay is large, it has an application field like the data delivery using a satellite, and the super-long-distance delivery which amounts to tens of thousands of K.

[Translation done.]

* NOTICES *

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TECHNICAL FIELD

[Industrial Application] This invention relates to the continuation data delivery approach and a system, delivers to a terminal AV (Audio-Visual) information under photography, the alphabetic character and the numerical information (it is called sequence-code information below) which was inputted by suitable frequency in succession and coded according to a specific format, the AV information stored in the mass database, and sequence-code information, and relates especially to the continuation data delivery approach and the system which offer the continuation data which reproduce immediately.
[0002] Moreover, this invention is applied also to a system which stores in a mass database the receipt information which received from the server, and reuses it in a terminal.

[Translation done.]

PRIOR ART

[Description of the Prior Art] There is a method of only transmitting delivery data from a server to two or more terminals as a delivery technique of the conventional continuation data at the time of delivery of data. For example, although what is performed in the MBONE experiment of the Internet is known, this uses multicast delivery (delivery to a terminal group). Since data are only only delivering in this delivery approach, processing to lack data is not performed.
[0004] Drawing 16 shows the data delivery sequence to conventional two or more terminals. In this drawing, the buffer used for a communication link is the Brock buffer. As for processing of informational coding/decryption, processing is performed in an encoder/decoder. Furthermore, AP buffer is formed as a middle buffer between coding/decryption, and communicative processing. Conventionally, there are some which do not use an application buffer.
[0005] In drawing 16 , if photography using a motion picture camera or a microphone of the real time of AV data is performed, it will be accumulated in an encoding buffer, AV segmentation will be carried out, and those AV data will be stored in an application buffer. When delivering this from a server to a terminal, it divides into a Redirection block, accumulates in the Brock buffer, and is delivered by two or more terminals for every Brock at the time of delivery.
[0006] In a terminal side, Brock who received from the server is accumulated in the Brock buffer, it is accumulated in an application buffer for every Redirection block, and output equipment is reproduced by decoding. In the case of sequence-code information, it processes carrying out graphical representation of the numeric value etc., and may be displayed on output equipment.
[0007] Moreover, there is also the approach of delivering serially the data only given as a conventional method, without blocking as it is. Data are delivered only once, without using, even when communication link idle time arises conventionally also in which method of transmitting the delivery or data based on blocking as it is.
[0008] In addition, a packet is [several M bytes and AV segment of about 1 K byte and Brock] about hundreds of bytes in magnitude.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] According to the continuation data delivery approach and system of this invention, redundant data delivery is efficiently realizable as mentioned above by recording the success or failure of data reception of a packet unit about continuation data like information. Since it is only collating of a packet sequence number and storing activation of a receive packet is judged especially, the data copy between an excessive storing field or memory is unnecessary, and efficient. Thereby, even when a data loss breaks out for degradation of a network data transmission error, or temporary receiving performance degradation in a terminal, continuation data are mistaken, and it is [that there is nothing] quality and can deliver to many terminals.
[0077] Since this invention does not resend, especially when a transit delay is large, it has an application field like the data delivery using a satellite, and the super-long-distance delivery which amounts to tens of thousands of K.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, at a terminal, as shown above, when loss arises to delivery data for the reason of the buffer having overflowed in the transmission error of the data on a network, or loss or an accepting station conventionally, since it is reproduced been missing, the quality of Redirection Information deteriorates. It has deteriorated, when received data were stored in a database at a terminal and it received.
[0010] Therefore, by the above-mentioned conventional method, since [of delivery data] it cannot be coped with to lack in part, the quality of receipt information deteriorates to network quality degradation or data loss with a terminal, and there is a problem of information playback of high quality becoming impossible. Even when it was made in view of the above-mentioned point and a data loss happens about continuation data like information or sequence-code information for degradation of a network data transmission error, or temporary receiving performance degradation in a terminal, this invention mistakes continuation data and aims at offering the continuation data delivery approach and system which can be delivered to many terminals. [there is nothing, and it is quality and]

[Translation done.]

MEANS

[Means for Solving the Problem] This invention is compensated by consecutive Brock's data, when the same Brock is transmitted to a multiple-times terminal and lack arises in the first-time Brock delivery through a communication network using the communication link idle time produced from a server according to the difference of an informational coding rate and the transmitting rate of a communication network in a server in the continuation data delivery approach which delivers information continuously to at least one terminal.
[0012] Drawing 1 is drawing for explaining the principle of this invention. Deliver this invention to a terminal in the packet unit which subdivided the Brock unit and Brock who gave the sequence number for continuous data in the server (step 1), and it is set to a terminal. The data of said Brock unit delivered from the server and said packet unit are received (step 2). Based on the sequence number of the packet of the data of a packet unit, record the success or failure of reception of a data packet unit (step 3), and record of the success or failure of reception and the sequence number of the packet which received just now are collated. If this receiving data packet has not received before, storing processing will be carried out at the Brock buffer (step 4), and if this receiving data packet is reception ending, it will discard, without storing (step 4).
[0013] Moreover, in a server, this invention prepares two or more Brock buffers, precedes and reads the information from the outside, stores it in these two or more Brock buffers, and it is controlled so that the opening of the Brock delivery to a terminal does not arise. Moreover, in a terminal, when this invention receives the notice of delivery initiation from a server, it returns a response to a server only to the notice of delivery initiation which received at the very beginning of data delivery.
[0014] Drawing 2 is the principle block diagram of this invention. The server to which this invention is connected through a communication network and this communication network, It is the continuation data delivery system which consists of at least one terminal which has data continuously delivered through this communication network from this server. It consists of servers 100 and terminals 300 including the application management tools 110 and 310 which manage delivery/reception of the continuation data divided per Brock, and the delivery processing means 120 and 320 which divide Brock into a packet and carry out delivery processing per packet.
[0015] Moreover, the delivery processing means 120 of the above-mentioned server 100 includes a duplication delivery means 140 to overlap to a terminal and to deliver in the Brock unit which gave the sequence for continuous data, and the packet unit which subdivided Brock. Moreover, the above-mentioned terminal 300 will carry out storing processing, if the data packet which received has not received before with reference to a success-or-failure record means 350 to record the success or failure of reception of a data packet unit based on a sequence number, and the success-or-failure record means 350, and it includes a packet storing / cancellation means 380 to cancel if it is a data packet [finishing / reception].
[0016] Moreover, the delivery processing means 120 of the above-mentioned server 100 contains a notice means 160 of delivery initiation to deliver the notice packet of delivery initiation to a terminal in advance of the next Brock delivery at the very first of data delivery, and ** of delivery of Brock, and a

notice means 150 of the completion of delivery to deliver the notice packet of the completion of delivery to a terminal at the time of completion of delivery.
[0017] Moreover, the delivery processing means 320 of the above-mentioned terminal 300 includes a response means 360 to return a response to a server 100, only when the notice of delivery initiation is received from a server and the notice of delivery initiation concerned is a notice of the very first of data delivery. Moreover, the delivery processing means 120 of a server 100 has two or more Brock buffers, precedes reading from the application buffer of an application management tool, and includes the 1st precedence storing means stored in this block buffer.
[0018] Moreover, the application management tool 310 of a terminal 300 has two or more application buffers, precedes reading from the Brock buffer of the delivery management tool 320, and includes the 2nd precedence storing means stored in this application buffer.
[0019] As mentioned above, in case information is continuously delivered from a server to two or more terminals through a communication network, this invention transmits the same Brock to a multiple-times terminal using the communication link idle time produced according to the difference of an informational coding rate and the transmitting rate of a communication network, and since it transmits Brock of multiple-times identitas even if it is the case where lack arises in the first-time Brock delivery, it can compensate him by the data of the Brock concerned.
[0020] This invention moreover, by recording the success or failure of reception of a data packet unit by the terminal side based on the sequence number of the packet of the data of a packet unit which received from the server It is possible to complement lack, loss, etc. of Brock certainly by storing and carrying out reception to the Brock buffer, if the data packet which received has not received with reference to record of the success or failure of reception, and performing processing discarded without storing, if the data packet concerned is reception ending. Since data storage is especially judged only by enquiry of a packet sequence number, even if it performs duplication reception, the data copy between an excessive storing field or memory is unnecessary.
[0021] Moreover, the opening of the Brock delivery to a terminal does not produce this invention by preparing two or more Brock buffers, preceding and reading the information from the outside in a server, and storing in these two or more Brock buffers. Moreover, in a terminal, when this invention receives the notice of delivery initiation from a server By returning a response to a server, omitting the response in the notice of delivery initiation after the 2nd Brock only to the notice of delivery initiation of the beginning of data delivery, overlapping also about the notice of delivery initiation concerned, and transmitting to a terminal While aid is given like the above, it becomes possible to shorten the communication link time amount of the whole data.
[0022] Moreover, in a terminal, when this invention receives the notice of the completion of delivery from a server, it becomes possible [using as accounting information to the data received by the terminal side] by transmitting record of the success or failure of reception to a server.
[0023]
[Embodiment of the Invention] Drawing 3 shows the system configuration to which this invention is applied. As for the communication system of the information shown in this drawing, the encoder 107 which encodes the information acquired from the motion picture camera and the microphone 106, and the database 108 which accumulates encoded AV information or sequence-code information are connected to a server 100. Sequence-code information may be serially stored in the database from the exterior.
[0024] moreover, each terminal 3001 and 3002, --, 300n **** -- the output equipment 301 and the database 302 which carry out the playback output of the decoded information are connected. Moreover, a server 100, two or more terminals 3001, and 3002, --, 300n It connects with the communication network 200 of a cable or wireless, the communication network 200 concerned is minded, and they are each terminal 3001 and 3002, --, 300n from a server 100. Data delivery is carried out.
[0025] It encodes with an encoder 107 and the information inputted with the motion picture camera and the microphone 106 is incorporated by the server 100. Information is beforehand stored in the mass database 108, and may be incorporated by the server 100 from there. In a terminal 300 side, the

information delivered from the server 100 is immediately outputted to the output equipment 301, such as a monitor and a loudspeaker. Receipt information may be stored in a database 302 at a terminal 300. The above is the example of use of the usual continuation data delivery service.

[0026] Drawing 4 shows the configuration of the server of this invention. The server 100 shown in this drawing consists of the application Management Department 110, the delivery Management Department 120, and the communications control section 130. The application Management Department 110 has the application process section 112 which carries out division management of the continuation data of the application buffer 111 and the application buffer 111 concerned at Brock. The delivery Management Department 120 has the delivery processing section 122 which requires next Brock of the application process section 112, whenever it performs data transfer of the Brock unit of the Brock buffer 121 and the Brock buffer 121 concerned, and the subdivided packet unit and one Brock delivery finishes.

[0027] Drawing 5 shows the configuration of the delivery processing section of the server of this invention. The delivery processing section 122 consists of the packet delivery processing sections 1221, and the delivery initiation / post process sections 1222 containing the packet managed table 1223. The packet delivery processing section 1221 carries out division delivery of Brock per packet, and manages the success or failure of the delivery concerned in the packet managed table 1223. Delivery initiation / post process section 1222 manages about initiation and termination of packet delivery.

[0028] Drawing 6 shows the example of the packet managed table of the server of this invention. The packet managed table 1223 shown in this drawing manages each packet location of the Brock buffer 121 for every packet number. As shown in this drawing, as for the packet managed table 1223, the storing location on memory also specifies the sequence number (packet number) for each [allocation and] packet of every for every packet. Although a program mounting top establishes the packet storing region of a fixed size in number correspondence, it is not explicitly expressed to the storing location on memory in many cases.

[0029] Drawing 7 shows the configuration of the terminal of this invention. The terminal 300 shown in this drawing has the application Management Department 310, the delivery Management Department 320, the communications control section 330, and a decoder 341. The application Management Department 310 has the application process section 312 and the application buffer 311, acquires the information passed from the delivery Management Department 320, and stores in the application buffer 311.

[0030] The delivery Management Department 320 has the delivery processing section 322 and the Brock buffer 321, and the delivery processing section 322 performs reception of data per the Brock unit and subdivided packet from a server 100 through the communications control section 330, and passes a receiving block to the application process section 311 of the application Management Department 310 for every completion of the Brock reception.

[0031] A decoder 340 is outputted to an external AV output or a database 302 while it decodes the encoded information which was passed from the application Management Department 310 and accumulates it in the decoding buffer 341. Drawing 8 shows the configuration of the delivery processing section of the terminal of this invention. The delivery processing section 322 has the packet delivery processing section 3221, and the delivery initiation / post process section 3222 containing the packet managed table 3223.

[0032] As shown in drawing 9 , for every packet number which received, the packet managed table 3223 shows each packet location of the Brock buffer 321, and manages a receiving settled one or un-receiving for every packet concerned further. Thus, the packet managed table 3223 of a terminal 300 also has the field which records received [packet]/un-receiving for every packet for every packet. Although Ox shows success or failure in this drawing, they are expressed on mounting by 1 bit of Bit ON (= 1) or Bit OFF (= 0). A packet sequence number is an integer, and when 10-M byte Brock is divided into the packet of 1-K byte length, it becomes from No. 1 to No. 10000. The format of a storing location follows the usual format of being used in each computer system or the programming language which describes a table.

[0033] Next, a series of outline actuation of the above-mentioned configuration is explained. Drawing

10 is drawing for explaining a series of actuation of continuation delivery of this invention. If a delivery demand is received from the exterior, the application process section 112 will divide the data of the application buffer 111 into Brock, and will notify the notice of delivery initiation to a terminal 300.
[0034] In delivery initiation / post process section 3222 of the delivery processing section 322 of a terminal 300, if the notice of delivery initiation is received, the delivery Management Department 322 of a terminal 300 prepares the Brock buffer 321, and the application process section 312 will prepare the application buffer 311 and the Brock managed table 3223, and it will prepare reception.
[0035] The application process section 112 of a server 100 passes data to the delivery processing section 122 per Brock. In the delivery processing section 122, the Brock buffer 121 is prepared and multiple-times Brock transmission is performed. This drawing shows 3 times of examples for this count of duplication.
[0036] A terminal 300 stores the packet in the Brock buffer 321, if a data packet is received in the communications control section 330 and it will not have received with reference to the packet managed table 3223 (when the packet concerned is received for the first time). If it is already receiving settled, the packet concerned will be discarded without storing.
[0037] The receiving success percentage of a loss packet can be raised by actuation of this terminal 300. Moreover, since an existing receive packet is discarded immediately, its data copy between an excessive storing field or memory is unnecessary. Detection of the bit error error of a packet and abandonment of an error packet are performed in connection processing with a network, transfer processing of a packet, and a list in a server 100 and the communications control sections 130 and 330 of a terminal 300.
[0038] Thus, in this invention, the same Brock is delivered to multiple-times (this drawing 3 times) each terminal 300. Duplication reception of Brock is carried out at a terminal 300. Although mentioned later, in the delivery 2nd after the same Brock, only a non-receive packet is stored in the block buffer 321, and an existing receive packet is canceled immediately.
[0039] In addition, although this drawing shows the case where duplication delivery is 3 times, according to the difference of the data transmitting rate which can be used in coding and an informational decryption rate, and an informational network 200, there are 2 times of cases and there are also 4 times or more of cases further. Thus, in a server 100, by using the idle time of the following new Brock delivery after the Brock delivery for duplication delivery, and performing duplication reception in a terminal 300 based on a packet sequence number, this invention can realize efficient redundant data delivery, and can aim at improvement in the quality of received data.
[0040] Moreover, multicast transmission (broadcast of data which specified the group) to two or more terminals is realizable by using OS (operating system) in which a multicast communication link is possible. That is, it is UDP (User Datagram Protocol) as a server 100 and the communications control sections 130 and 330 of a terminal 300. And IP (Internet Protocol) It is realizable by using OS in which protocol processing is possible. Especially, OS which can process the group address (class D address) of IP is used. In processing of UDP, detection of the bit error of a receive packet and abandonment of a bit error packet are also included.
[0041] Moreover, commercial production (LSI, communication board) of the encoder and decoder based on a coding approach MPEG standardization of the low bit rate in high efficiency and the approach of MPEG progresses as an informational coding technique, and it is becoming available by one side a high-speed network technique [like a Frame Relay or ATM] whose network is also. This invention uses for duplication delivery the idle time of the data delivery produced such a low bit rate information coding technique and by using a high-speed network. Moreover, duplication delivery can be more nearly similarly performed by using a high-speed network with low bit rates, such as an alphabetic character and numerical information, also about the sequence-code information which can be encoded. Here, the decoder of the same decode rate as the encoder which also uses an informational decryption for coding is usually used.
[0042] The example of coding and a decryption rate is shown below.
MPEG1:1.5 Mb/s Extent;
MPEG2:6 Mb/s Extent;

MPEG4:64 Kb/s Extent;
Character code: 6.4 Kb/s Extent (in the case of 400 characters/[s and] and a 2 byte code): The example of a network transmission speed is shown below.
ATM:156 Mb/s and 622 Mb/s : Ethernet LAN:10 Mb/s and FDDI-LAN:150 Mb/s : High-speed dedicated line and Frame Relay:1.5 Mb/s and 6 Mb/s etc. -- :

[Translation done.]

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EXAMPLE

[Example] Hereafter, the example of this invention is explained with a drawing. First, the server 100 and terminal 300 which are shown in drawing 4 and drawing 7 are explained. A server 100 and a terminal 300 have the application buffers 111 and 311 to the application Management Department 130 and 330, and the application process section 112 passes delivery data to the delivery processing section 122 per Brock in a server 100. It has the Brock buffer 121 to the delivery Management Department 120, and in a server 100, the delivery processing section 122 divides Brock of the Brock buffer into a data packet, and performs data delivery through the communications control section 130.
[0044] At the terminal 300, it judges [to which the delivery processing section 322 receives the data packet which received through the communications control section 330 / or or] whether abandonment is carried out, and stores in the Brock buffer 321. By the opportunity, like a packet gathers altogether, the data block which received is stored in the application buffer 311 through the application process section 322.
[0045] The application buffers 111 and 311 have 121 or 321 or more Brock buffers magnitude. In the server 100 side, it is consumed in the Brock unit through the application process section 112 by the order in which AV segment passed from the encoder 107 is serially accumulated, and data (AV segment) were stored for delivery.
[0046] In the terminal 300 side, Brock who received from the delivery processing section 122 of a server is serially accumulated in the application buffer 311 through the delivery processing section 322 and the application process section 312, and it is consumed by the accumulated order per AV segment for an external output or the are recording to a database 302.
[0047] In this example, an encoder 107 is set to the exterior of a server 100, and a decoder 340 considers it as the configuration prepared in the terminal 300 interior. Of course, an encoder 107 is possible also for the configuration in which an one configuration with a server 100 and a decoder 340 are formed in the exterior of a terminal 300.
[0048] Usually, the configuration which became independent since the load of processing of the direction of an encoder 107 was large is taken in many cases, and since commercial production progresses and a decoder 340 is incorporated in a terminal as LSI or a board in many cases, it is taken as the configuration shown in drawing 7 . In case delivery is started from a server 100 to a terminal 300, in advance of data delivery, the notice packet of delivery initiation is delivered from delivery initiation / post process section 1222 of the delivery processing section 122 of a server 100.
[0049] Drawing 11 shows the configuration of the notice packet of delivery initiation of one example of this invention. This is notified to a terminal 300 from a server 100 in advance of the next Brock delivery for every very first of data delivery, and delivery of Brock. To two or more terminals, it shall carry out by the multicast for effectiveness. the next Brock delivery initiation is boiled by way of precaution, and the 2nd notice more than packet of delivery initiation performs it, in order to tell a terminal 300. A terminal 300 can obtain the opportunity of completion of the Brock delivery of one batch, and the next Brock reception preparation also by the time-out of reception by the time of completing the packet reception for 1 Brock, and 1 Brock.

[0050] A packet ID 602 which shows the classification (it is a notice packet of delivery initiation) of the terminal destination 601 and a packet, and Redirection Information 603 are consisted of by the notice packet 600 of delivery initiation shown in this drawing. A block size 605 and the Brock delivery contain in Redirection Information 603 the block number 606 which shows what position.
[0051] About the code length of a block number 606, if it encodes by 16 bits, it can express to 65536 pieces by the 16th power of 2, and can treat to about 655.36 G bytes by 10-M byte Brock. If it encodes by 32 bits, it can express to 4, 294, and 967 or 29 pieces by the 32nd power of 2, and can treat to abbreviation 42949.6Tbyte by 10-M byte Brock. When short 100-K byte Brock is used, and a block number 606 is encoded by 16 bits and 32 bits, the data volume to about 6.55 G bytes and about 429 Tbyte(s) can be treated, respectively, and it is satisfactory practically.
[0052] I have a response returned from a terminal to the notice packet of delivery initiation delivered from the server 100 for a check. However, although delivered at the time of delivery initiation and Brock's head delivery, returning and getting a response from a terminal 300 considers only as the time of delivery initiation, and, as for the notice packet of delivery initiation, it does not perform this response waiting by delivery of Brock other than an intermediate head. Instead, in order to overlap and to transmit a notice packet, it is effective in notice packet loss in a network etc. If a block size also uses a fixed value, the block size notified by the first-time notice packet of delivery initiation will be used fixed.
[0053] Drawing 12 shows the data configuration of the data packet of one example of this invention. The data packet shown in this drawing is a packet which divides and sees off Brock in a terminal 300 from a server 100. A data packet D00 consists of the terminal destination D01, the packet classification D02, packet number D0B, packet number D0P, and user data D-3. In two or more destination delivery, the group address is used for the terminal destination D01. It is shown in the packet classification D02 that it is a data packet. The block number (sequence number) of the notice packet of delivery initiation shown in drawing 11 is set as block number D0B. The sequence number of the packet concerned is encoded by packet number D0P. The data which divided Brock are set to the user data division D03.
[0054] Here, the block number is used for judging this packet with a block number and discarding it, when the packet of Brock before the receiving block concerned whom reception has already completed has been lost while receiving a series of data packets at a terminal 300.
[0055] Drawing 13 shows the configuration of the notice packet of the completion of delivery of one example of this invention. The notice packet F00 of the completion of delivery has the packet classification which indicates it to be the terminal destination F01 that it is the notice of the completion of delivery. In the delivery to two or more terminals, the group address is used to the terminal destination F01.
[0056] Based on drawing 14 and drawing 15 , the server 100 of this example and actuation of a terminal 300 are explained below. Drawing 14 is the flow chart of the delivery procedure of the server of one example of this invention.
Step 801 Directions of data delivery are performed from the exterior of a server 100 to the application process section 112 of a server 100. At this time, the group of a terminal 300 and the continuation data which should be transmitted are specified.
[0057] Step 802 As for a server 100, the application buffer 111 is prepared for the application Management Department 110 as preparation of delivery initiation. At the delivery Management Department 120 of a server 100, the packet managed table 1223 in the packet delivery processing section 1221 is prepared according to the Brock buffer 121 and a block size, and a packet size. This block buffer 121 is premised on the field which took into consideration a server 100 and the available memory size of each terminal 300 beforehand being secured on memory.
[0058] Step 803 The application process section 112 directs initiation of delivery in the delivery processing section 122. Thereby, delivery initiation / post process section 1222 generates the notice packet 600 of delivery initiation, and transmits to a terminal 300 by the multicast.
Step 804 Delivery initiation / termination section 1222 stands by that the response from each terminal over the notice packet of delivery initiation gathers. When all responses from a terminal 300 gather, or when the time limit comes by the time-out, the member of the terminal 300 which delivers is decided.

This member is the range of a group specified at step 801. Moreover, at this time, a server 100 is notified to the external encoder 107, and the input and coding of the information from the outside start. The encoded continuation data are serially stored in the application buffer 111.
[0059] Step 805 To the Brock buffer 121 of the delivery Management Department 120, 1 Brock is incorporated from the application buffer 111.
Step 806 The delivery Management Department 120 does packet division, and delivers 1 Brock of the Brock buffer 121. To two or more terminals, it delivers through the communications control section 130 using a multicast.
[0060] Step 807 Only the count of a convention of the same Brock carries out duplication delivery of the delivery Management Department 120 further.
Step 808 It judges whether there is the next Brock delivery succeedingly or there is nothing. Termination is notified from the application process section 112, or delivery initiation / post process section 1222 judges termination of delivery by the time-out. In termination, it shifts to step 810, and shifts to step 809 at the time of continuation.
[0061] Step 809 In continuation, delivery initiation / post process section 1222 increments a block number, sends the notice packet 600 of delivery initiation, notifies that next Brock's delivery is succeedingly carried out to each terminal, shifts to step 805, and shifts to next Brock's delivery. Unlike processing of step 803 in which the first notice is performed, at this time, the response from a terminal 300 shortens the time amount to the next Brock resending by not standing by but shifting to the next resending immediately. In this case, two or more notice packets of delivery initiation can cope with it to loss of the notice packet in network superiors by sending to each terminal.
[0062] Step 810 In next Brock's delivery initiation directions termination, delivery initiation / post process section 1222 generates the notice packet F00 of delivery termination, and delivers it to a terminal 300. In the case of two or more terminals, it delivers using a multicast. The success or failure of reception of each terminal 300 are recordable by forming the procedure of the response from each terminal 300 here. This record is effective on management, when performing accounting to information delivery. Of course, the procedure in which a response is not performed from a terminal 300 can be mounted only by the notice to a terminal 300 from a server 100. Processing is ended, when all responses are received or it becomes a time-out.
[0063] Although the above processing was explained using the example in which one Brock buffer 121 is formed, it is also possible to prepare two or more Brock buffers and to carry out by preceding reading to the spare Brock buffer 121 from the application buffer 111. It is possible to control so that the opening of transmission does not arise by this for processing of step 805.
[0064] Next, the procedure of the terminal 300 corresponding to the delivery procedure of a server 100 is explained. Drawing 15 is the flow chart of the delivery procedure of the terminal of one example of this invention.
Step 901 In delivery initiation / post process section 3222 of the delivery processing section 322, a terminal 300 will be notified to the application process section 312, if the notice packet 600 of delivery initiation delivered from the server 100 is received.
[0065] Step 902 In the application process section 312, if the notice of delivery initiation is received, the application buffer 311 will be prepared and preparation will be checked in a decoder 340 and the external output unit 301, and a database 302. At the delivery Management Department 320, the Brock buffer 321 and the packet managed table 3223 of block soybeans of Redirection Information 603 are prepared. The packet managed table 3223 is decided by the block size and the packet size. In this example, a block size is notified by the notice packet 600 of delivery initiation, and it assumes that the packet size is beforehand decided by the system.
[0066] Step 903 The delivery processing section 322 of a terminal 300 returns the response to the notice of delivery initiation to a server 100. .
Step 907 After receiving the notice of delivery initiation, it will be in the state waiting for packet receiving. If a data packet is received, it will shift to the reception of one data packet of step 910. If the time-out of whether 1 Brock's packet receives the notice packet of delivery initiation [altogether] is

carried out with the waiting for a data packet, it will shift to step 920.
[0067] Step 910 The following steps 911, 912, and 913 explain storing/abandonment processing of one data packet. At the step concerned, all of a deed and the 1st Brock can also exclude processing of collating of the packet managed table 3223 by carrying out reception in delivery of each block to Brock of the first time not overlapping only to duplication Brock after the 2nd duplicate piece. In this case, the 1-bit field for distinction after the 2nd piece can be prepared and set in a packet configuration, and ** is good for one data packet.
[0068] Step 911 It judges whether the packet concerned of the packet managed table 3223 has received by using the packet number of one packet which received as a key (did you begin this time and receive?). When having not received, it shifts to step 912, and when having already received, it shifts to step 913. Moreover, at this time, the block number of a packet is also checked, and when the packet of an old block number has been lost, it shifts to step 913.
[0069] Step 912 It is term ** about O with which store a receive packet in the Brock buffer 321, and the packet concerned indicates a receiving settled one to be to the packet managed table 3223 if it has not received.
Step 913 It discards, when the packet of a finishing reception already or old block number has been lost.
[0070] Step 914 Delivery initiation / post process section 3222 judges whether they are whether Brock's packet receives delivery initiation [altogether] and a time-out.
Step 915 1 Brock is passed to the application buffer 311, when were, it sets to step 914 and one of terminating conditions is fulfilled. When the block count is accumulated suitably for the application buffer 311, the decoder 340 is outputted to the decryption, and the external AV output equipment 301 and an external database 302. It is for Brock's dying and making it not produce the way piece of an output especially to carry out two or more block number are recording, when outputting to AV equipment 301. It depends for a concrete value on the delay allowed from the size and the input of the application buffer 311 to an output. The following Brock buffer is prepared and the packet managed table 3223 is reset (all packets record un-receiving).
[0071] Here, although the case of one Brock buffer was explained, the next Brock reception performed succeedingly can be coped with with a spare buffer by preparing two or more Brock buffers. It is avoidable that the processing which passes Brock to AP buffer becomes the neck of reception by this.
[0072] Step 916 When the notice of delivery termination is received, it shifts to step 918 and, in not receiving, shifts to step 917.
Step 917 It becomes the waiting for the notice of delivery initiation. If the time-out of whether the notice of delivery initiation is received is carried out, it will shift to step 907 and will become next Brock's data packet receiving waiting. Also in two or more cases, the notice of delivery initiation is, but if at least one piece receives, it will shift to step 907.
[0073] If the notice of delivery initiation is lost in network 200 superiors here, next Brock's delivery will start suddenly, but since it is already prepared in step 915, reception of next Brock is possible. Moreover, when the notice of delivery initiation is already received in front of step 915, processing of the step 917 concerned is not performed.
[0074] Step 918 The response packet to the notice of delivery initiation is returned to a server, and reception termination is carried out. This processing is used when a server 100 manages the success or failure of information delivery to each terminal 300 based on the response from a terminal 300. There is also the mounting approach that this response is omitted.
[0075] In addition, modification and application are variously possible for this invention within the limits of an application for patent, without being limited to the above-mentioned example.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is drawing for explaining the principle of this invention.
[Drawing 2] It is the principle block diagram of this invention.
[Drawing 3] It is the system configuration Fig. where this invention is applied.
[Drawing 4] It is the block diagram of the server of this invention.
[Drawing 5] It is the block diagram of the delivery processing section of the server of this invention.
[Drawing 6] It is the example of the packet managed table of the server of this invention.
[Drawing 7] It is the block diagram of the terminal of this invention.
[Drawing 8] It is the block diagram of the delivery processing section of the terminal of this invention.
[Drawing 9] It is the example of the packet managed table of each terminal of this invention.
[Drawing 10] It is drawing for explaining a series of actuation of continuation delivery of this invention.

[Drawing 11] It is the data block diagram of the data packet of one example of this invention.
[Drawing 12] It is the data block diagram of the data packet of one example of this invention.
[Drawing 13] It is the data block diagram of the notice packet of delivery termination of one example of this invention.
[Drawing 14] It is the flow chart of the delivery procedure of the server of one example of this invention.
[Drawing 15] It is the flow chart of the delivery procedure of the terminal of one example of this invention.
[Drawing 16] It is a data delivery sequence to conventional two or more terminals.
[Description of Notations]
100 Server
106 Motion Picture Camera and Microphone
107 Encoder
108 Database
110 Application Management Department, Application Management Tool
111 Application Buffer
112 Application Process Section
120 Delivery Management Department, Delivery Processing Means
121 Brock Buffer
122 Delivery Processing Section
130 Communications Control Section
140 Duplication Delivery Means
150 Notice Means of the Completion of Delivery
160 Notice Means of Delivery Initiation
200 Communication Network
300 Terminal

301 AV Output Equipment
302 Database
310 Application Management Department, Application Management Tool
311 Application Buffer
312 Application Process Section
320 Delivery Management Department
321 Brock Buffer
322 Delivery Processing Section
330 Communications Control Section
340 Decoder
341 Decoding Buffer
350 Success-or-Failure Record Means
360 Response Means
380 Packet Storing / Cancellation Means
600 Notice Packet of Delivery Initiation
601 Terminal Destination
602 Packet Classification
603 Redirection Information
605 Block Size
606 Block Number
1221 Packet Delivery Processing Section
1222 Delivery Initiation Post Process Section
1223 Packet Managed Table
3221 Packet Delivery Processing Section
3222 Delivery Initiation / Post Process Section
3223 Packet Managed Table
D00 Data packet
D01 Terminal destination
D02 Packet classification
D0B Block number
D0P Packet number
D03 User data
F00 Notice packet of delivery termination
F01 Terminal destination
F02 Packet classification

[Translation done.]

* NOTICES *

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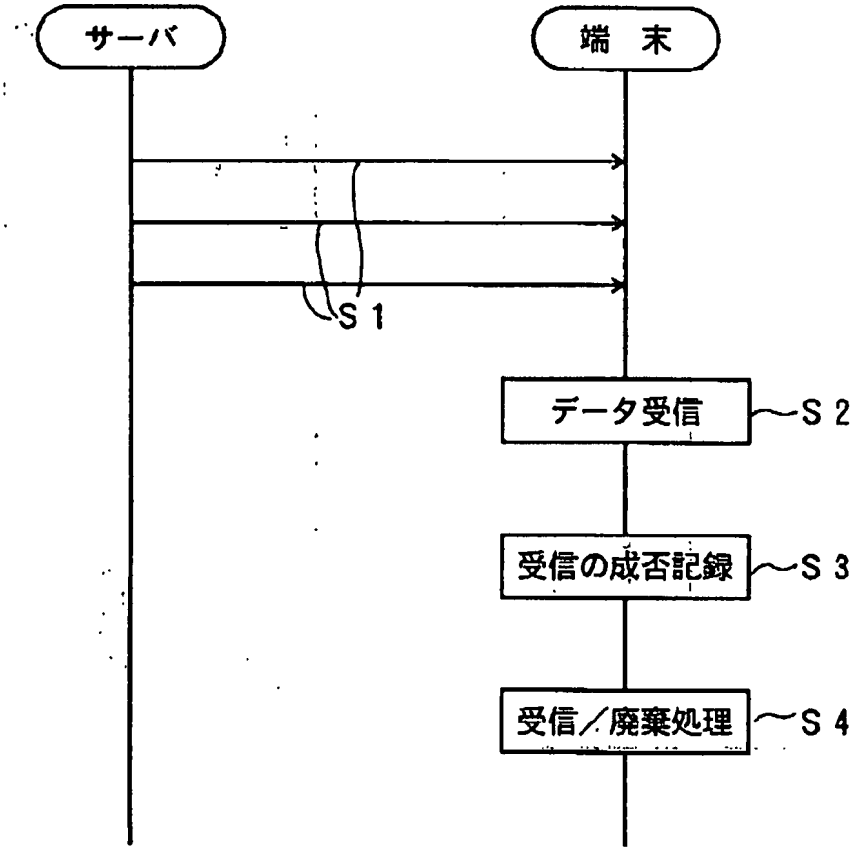
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

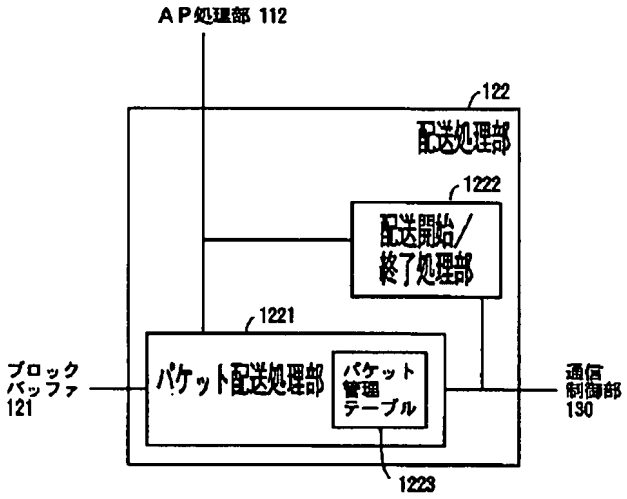
[Drawing 1]

本発明の原理を説明するための図



[Drawing 5]

本発明のサーバの配送処理部の構成図



[Drawing 6]

本発明のサーバのパケット管理テーブルの例

1223

パケット番号 ⟶

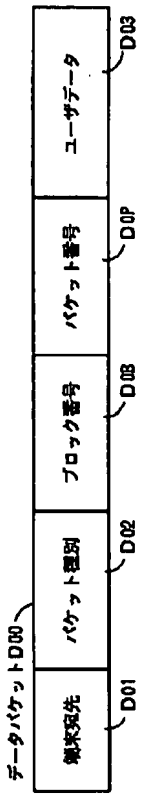
m：一つのブロックを
分割したパケット数

	1	2	3	4 ・・・・・		m
LOC	r1	r2	r3	r4		rk

LOC ri(i =1, 2, 3, ···, k) ：ブロックバッファの各パケット位置

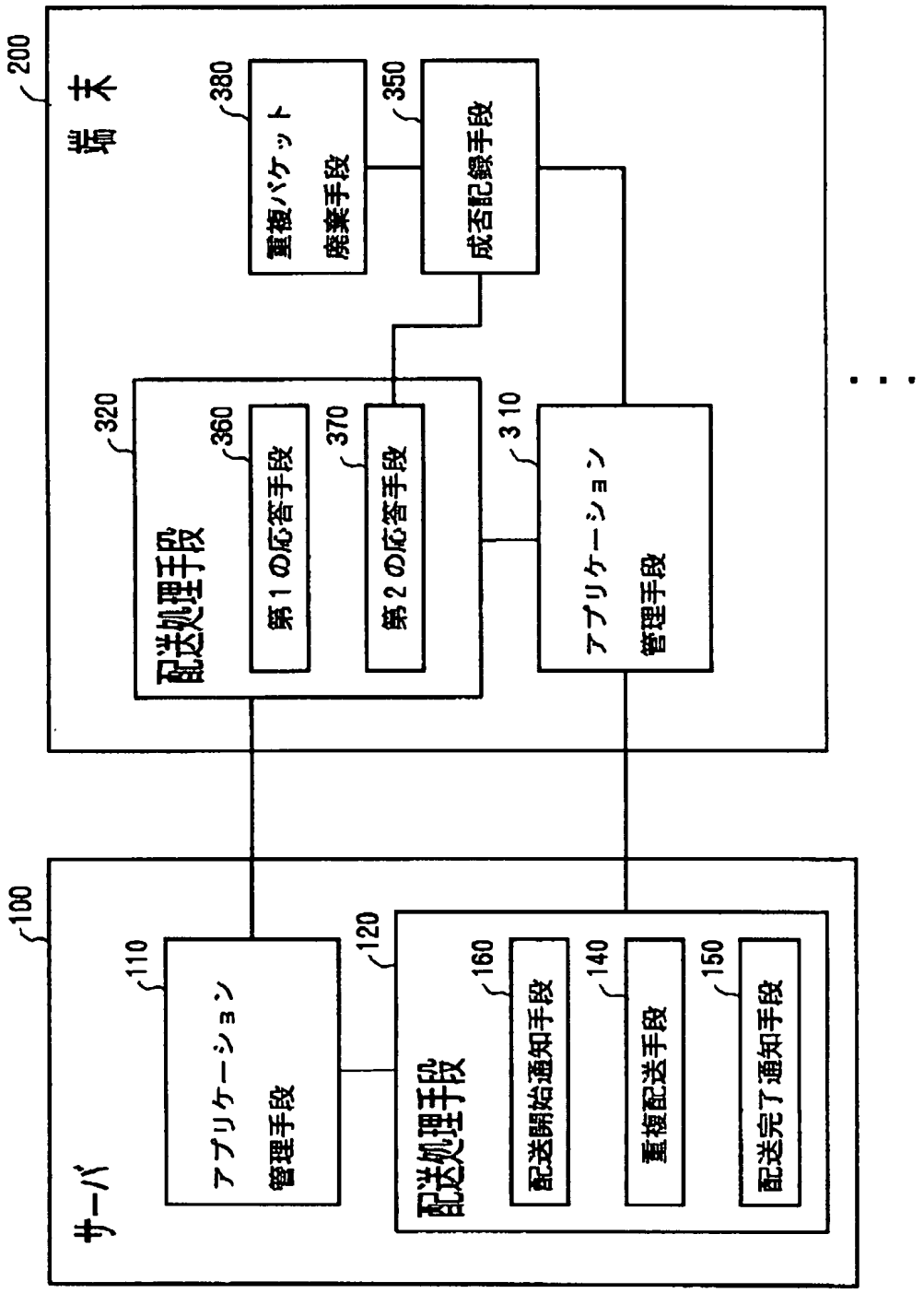
[Drawing 12]

本発明の一実施例のデータパケットのデータ構成図



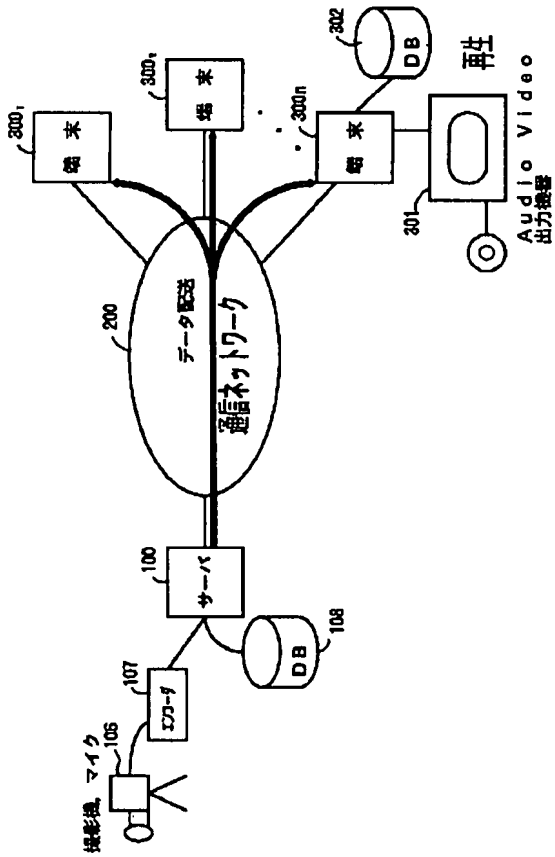
[Drawing 2]

本発明の原理構成図



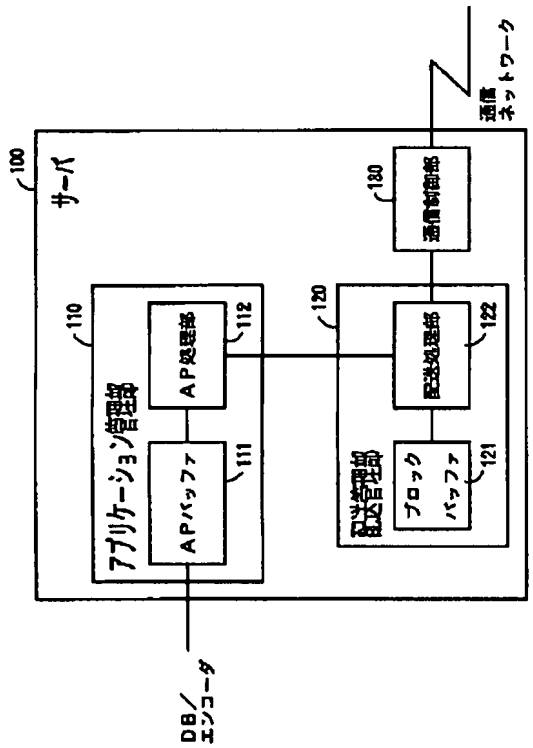
[Drawing 3]

本発明が適用されるシステム構成図



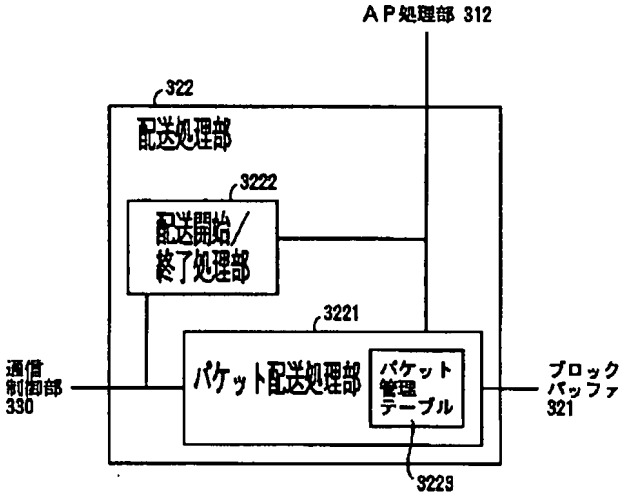
[Drawing 4]

本発明のサーバの構成図



[Drawing 8]

本発明の端末の配送処理部の構成図



[Drawing 9]

本発明の各端末のパケット管理テーブルの例

パケット番号 ⟶　　m：一つのブロックを分割したパケット数

	1	2	3	・・・・・		m
LOC	S1	S2	S3			Sk
済/未	○	○	×			○

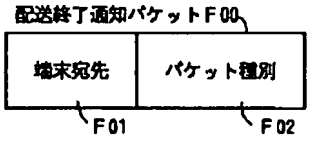
LOC Si(i =1, 2, 3, … k) ：ブロックバッファの各パケット位置

○：パケット受信済み

×：パケット未受信

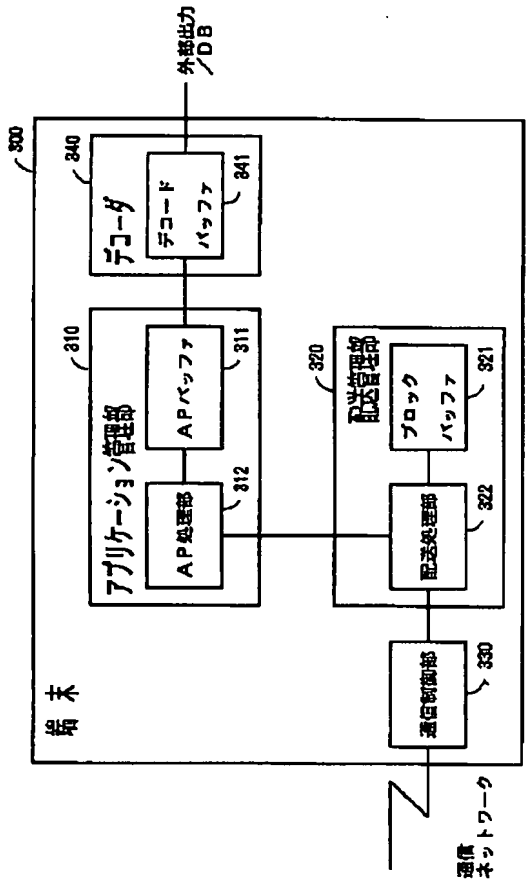
[Drawing 13]

本発明の一実施例の配送終了通知パケットのデータ構成図



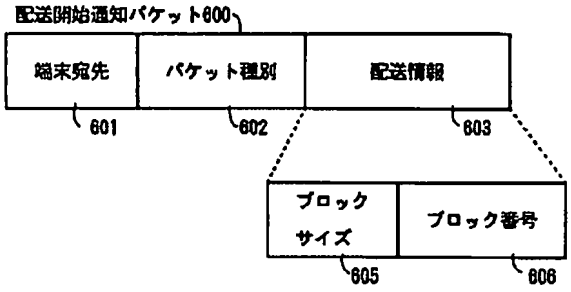
[Drawing 7]

本発明の端末の構成図



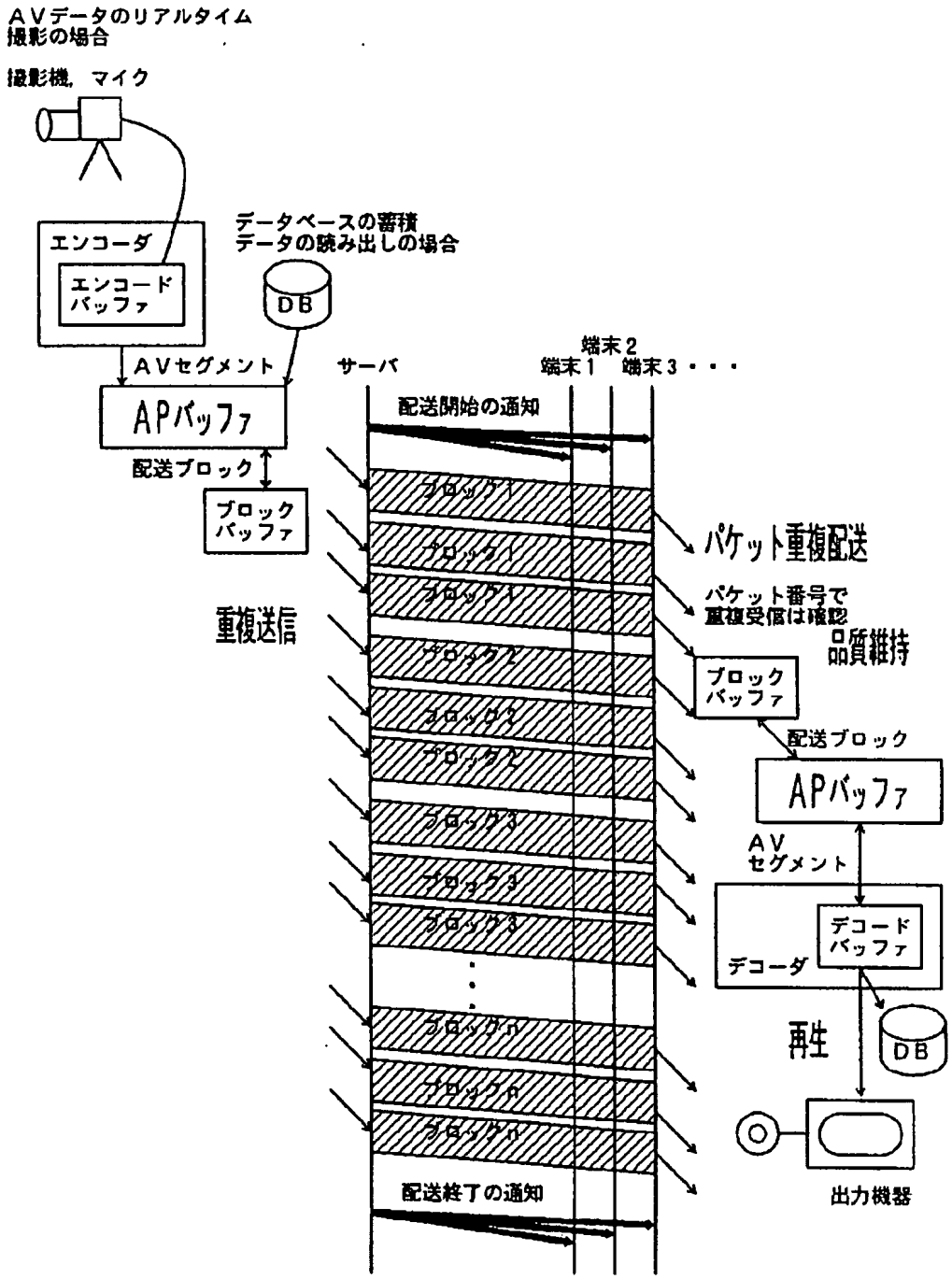
[Drawing 11]

本発明の一実施例の配送開始通知パケットのデータ構成図



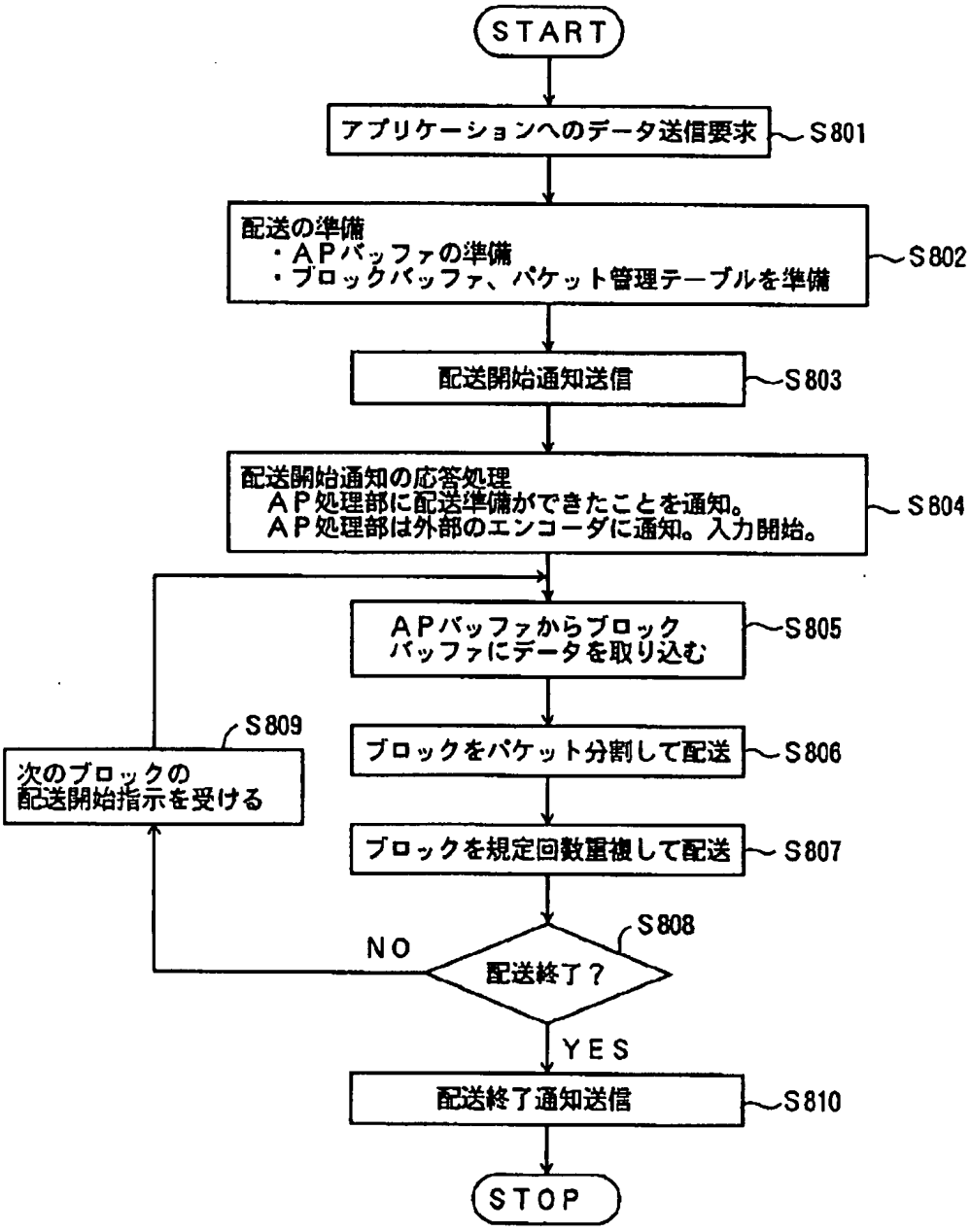
[Drawing 10]

本発明の連続配送の一連の動作を説明するための図



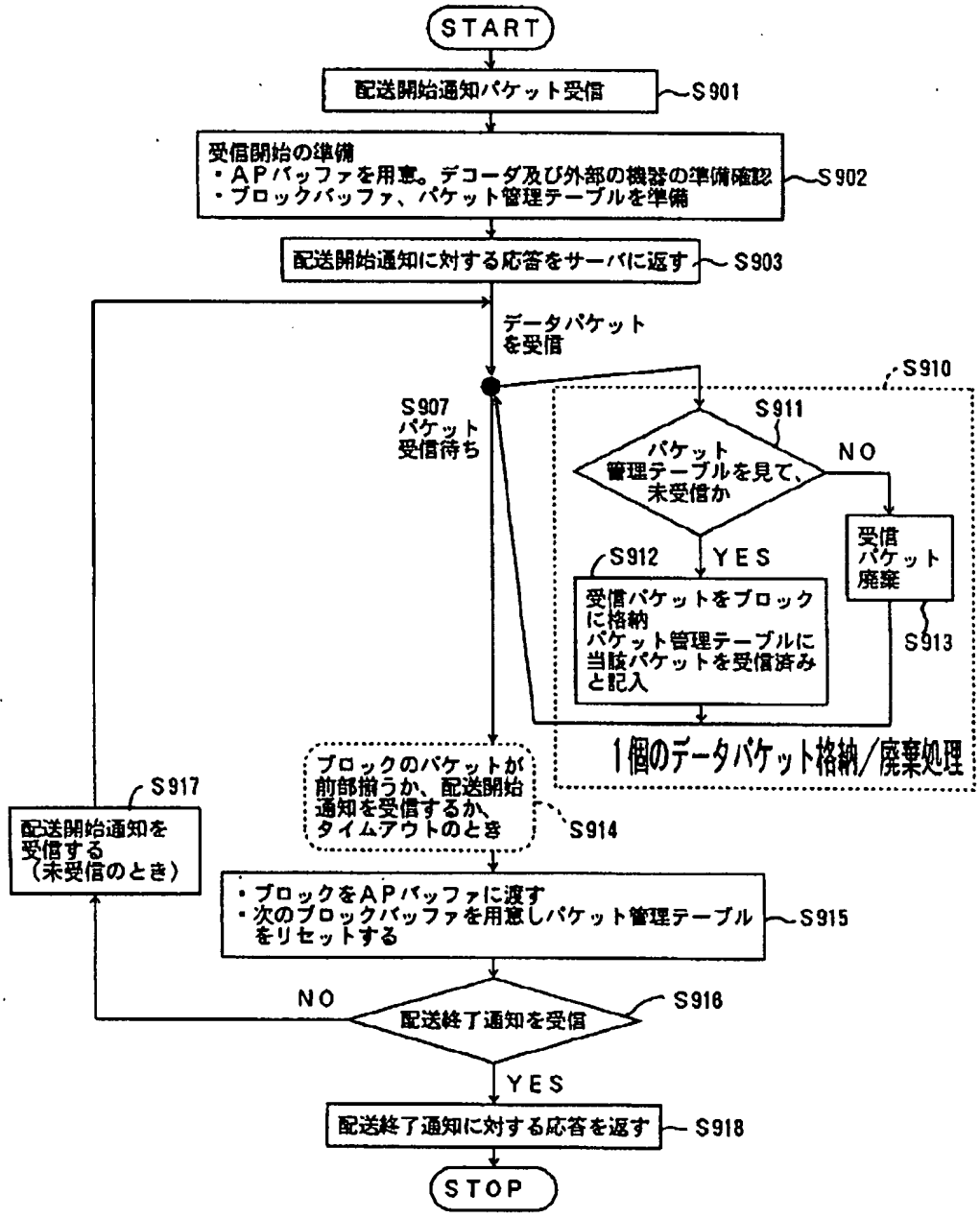
[Drawing 14]

本発明の一実施例のサーバの配送手順のフローチャート



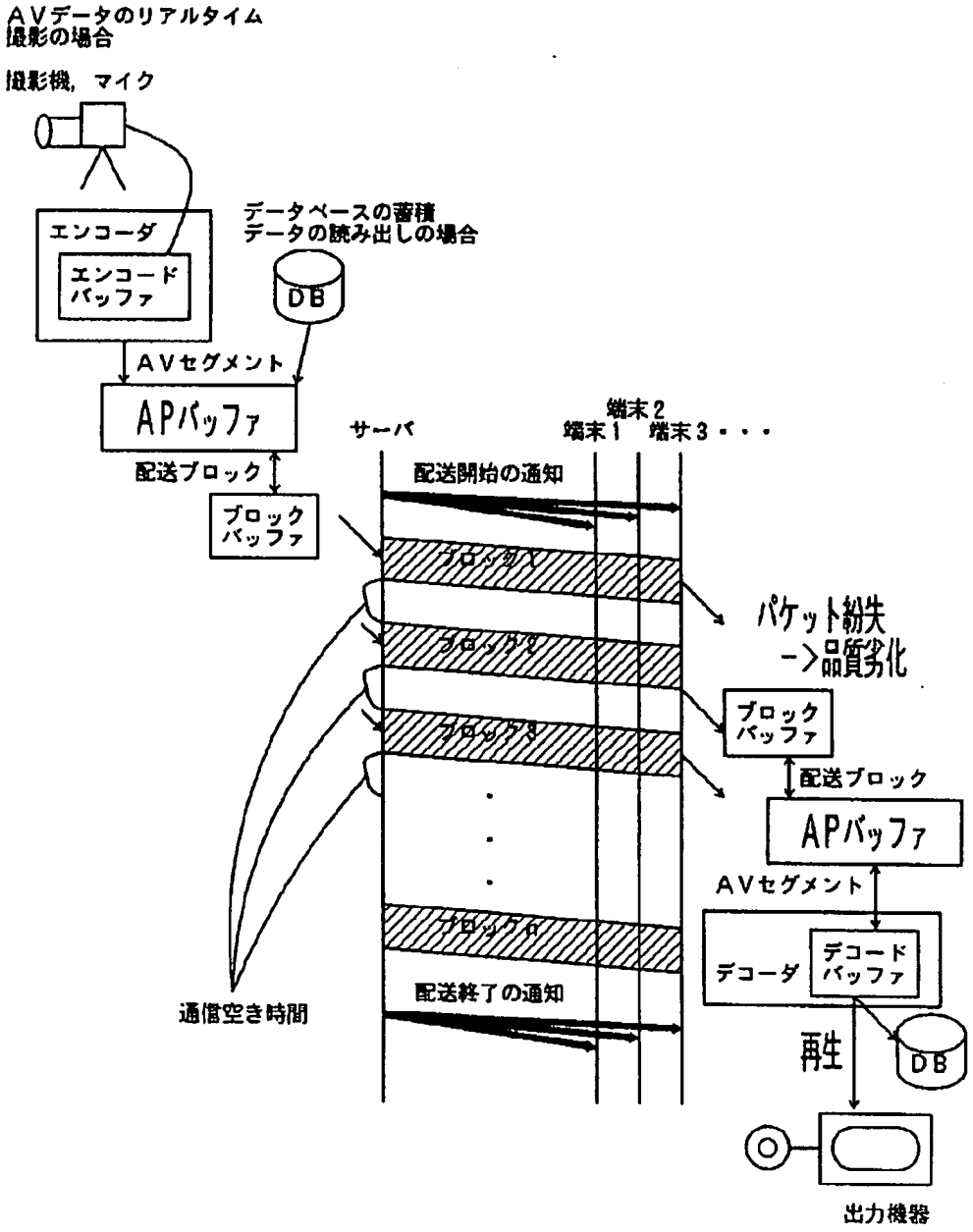
[Drawing 15]

本発明の一実施例の端末の配送処理手順のフローチャート



[Drawing 16]

従来の複数端末へのデータ配送シーケンス



[Translation done.]